

BackPac 40TM

User's Guide





Jasmine BackPac 40



Jasmine BackPac 40

Thank you for purchasing the BackPac 40 from Jasmine Technologies, Inc. It is 40 megabytes of silent, fully integrated power and flexibility. This is the "upgrade path" Macintosh Plus owners were hoping for. The BackPac offers the convenience and portability of an internal hard disk with the reliability and ease of installation of an external SCSI hard disk.

The BackPac is built and designed to give you years of reliable service. Everything you need to begin using your BackPac is included with your drive (except a Macintosh Plus). Jasmine offers a no excuse thirty day money back guarantee. We are confident that, after a test run, you will agree that there is no better hard disk drive value on the market. We welcome any suggestions you may have to help us to improve our products. We stand behind our products and offer excellent technical support ... should you ever need it.

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 (modem only, 300 or 1200 baud)

About This Manual

Please do not be "discouraged" by the length of this manual. It is well known that, due to the uniform, intuitive Macintosh interface, many users have developed the habit of not reading manuals! Using the BackPac is truly simple, and you will only need to read a few pages of this manual to *get started*. Read Chapter 1 to learn the basics -- setting up, powering up, and powering down. Then read Chapter 5, which discusses copying files to the hard drive and, more importantly, using copy protected software on the drive.

Make it a priority to read the rest of the manual to familiarize yourself with all the nuances of the BackPac.

Acknowledgments

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We would like to thank the following people (in no particular order) for their technical and editorial contributions: Steve Costa, Mike Mikel, Alan Brunner, Ben Park, and Al Agius-Sinerco.

And of course, a special thanks to Apple for creating the Macintosh.

1.0

Jasmine Serial Number

Your Jasmine serial number is located on a tag in the lower right-hand corner of the "inner" side of the BackPac. Please write this number on the line provided below and also on your invoice. If you ever need technical assistance, you will be required to provide this Jasmine serial number to our technical representative.

Do it NOW!

Jasmine Serial Number _____

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Apple Macintosh System files are copyrighted programs of Apple Computer, Inc., licensed to Jasmine Technologies, Inc. to distribute for use only in combination with Jasmine software entitled Jasmine Mount, Jasmine Park, and any Jasmine format programs. Apple software shall not be copied onto another diskette (except for archive purposes) or into memory unless as part of the execution of Jasmine Mount, Jasmine Park, and Jasmine format programs. When Jasmine Mount, Jasmine Park, and Jasmine format programs have completed execution, Apple software shall not be used by any other program.

Jasmine Technologies, Inc. makes no warranties, either express or implied, regarding the enclosed computer software package, its merchantability, or its fitness for any particular purpose. The exclusion of implied warranties is not permitted by some states. The above exclusion may not apply to you. This warranty provides you with specific legal rights. There may be other rights that you may have which vary from state to state.

Limited Warranty on Hardware

Jasmine Technologies, Inc. ("Jasmine") warrants the BackPac and cabling against defects in materials and workmanship for a period of one year from the date of original retail purchase.

If you discover a defect, Jasmine will, at its option, repair, replace, or refund the purchase price of the product at no charge to you, provided you return it during the warranty period, transportation charges prepaid, to Jasmine. This warranty does not apply if the product has been damaged by accident, abuse, misuse or misapplication, has been modified without the written permission of Jasmine, or if any Jasmine serial number has been removed or defaced.

Chapter 1 - Getting Started

The BackPac is very easy to use and even easier to set up. This chapter provides you with basic instructions which will ensure its proper operation.

Setting Things Up

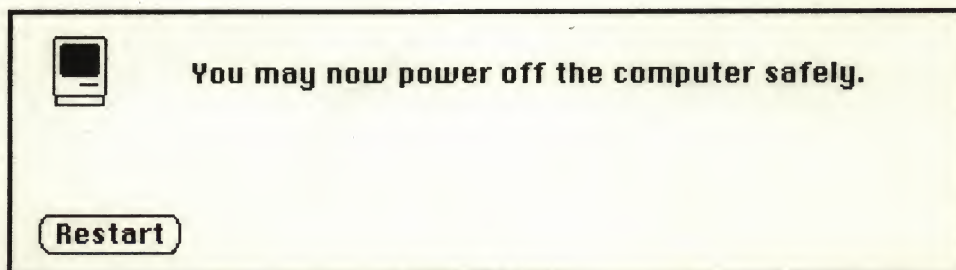
Your BackPac is preformatted... ready to go. Unwrap the drive and save all the packing materials. If the drive ever has to be returned for servicing, you will need these materials.

The shipping box should contain the following:

- The BackPac 40 (please handle with care)
- Torx Key
- One Diskette titled "Jasmine BP Disk"
- An Invoice/Warranty
- A Manual
- Foam Packing Materials

If you are missing any of the above items, please contact our office.

If your Macintosh is on, choose Shut Down from the Special menu. The following dialog box will appear:



Under System 3.2/Finder 5.3 or earlier, this dialog box will not appear. Instead, the screen will go blank. When the Macintosh "bongs", turn it off, then unplug it.

Please refer to Figures 1 & 2 on the following two pages for the remaining discussion on setting up the BackPac.

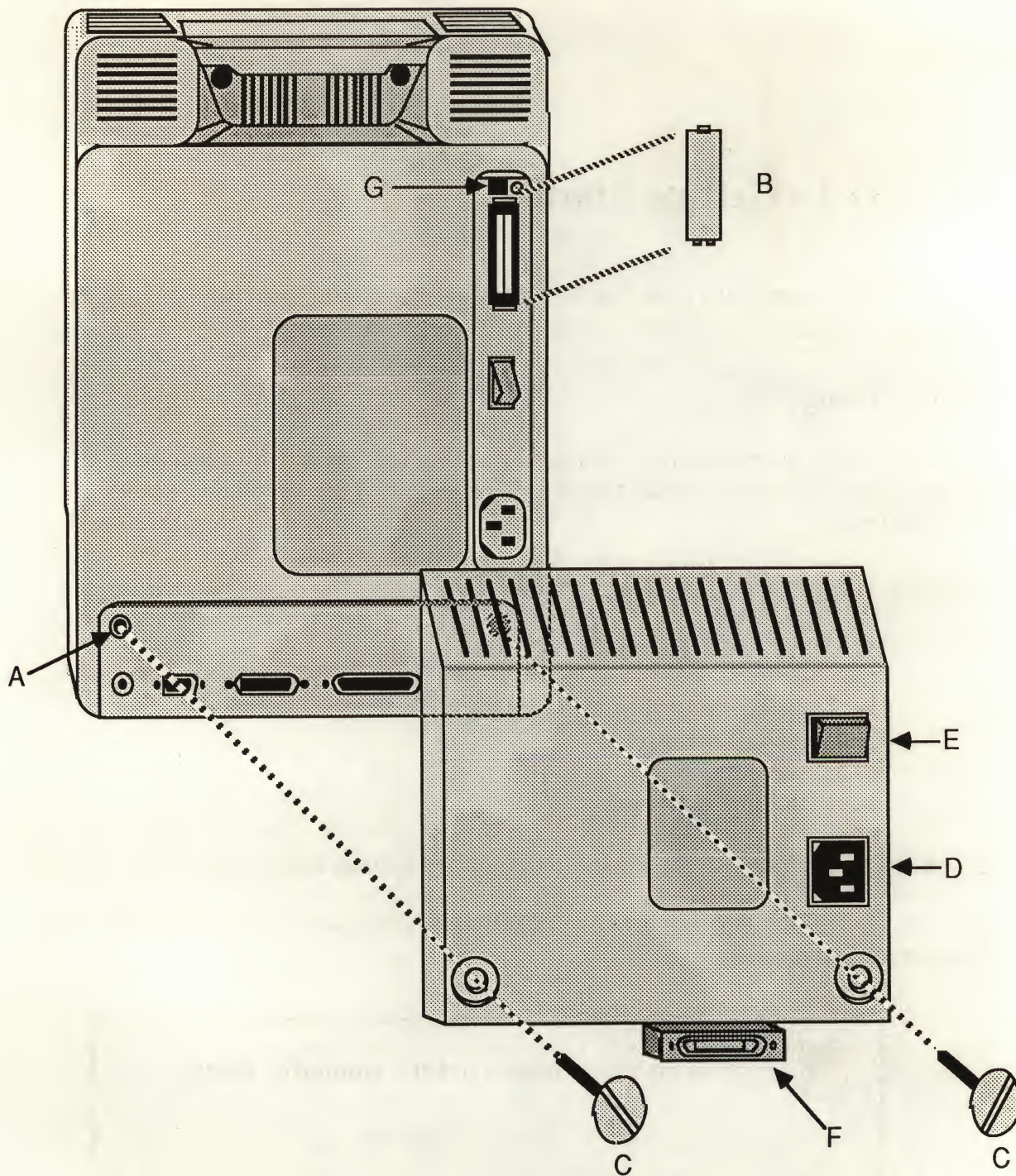


Figure 1

1) Rotate the Macintosh until its back is facing you. Remove the power cord and any other cables connected to the Macintosh.

2) Using the torx key (Fig 2-H), remove the two lower Macintosh case screws (Fig 1-A), which are adjacent to the mouse and modem ports. Snap the two screws (Fig 2-I) into the recess on the "inner" side of the BackPac (Fig 2-M).

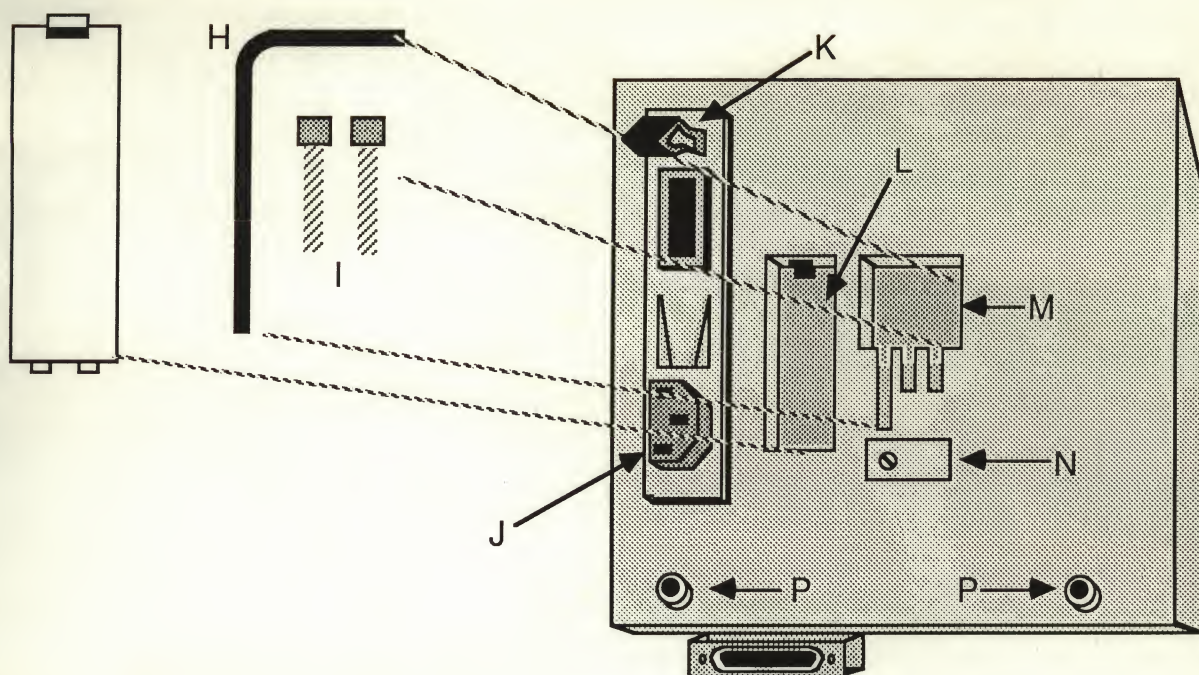


Figure 2

- 3) Remove the battery cover (Fig 1-B) and snap it into the corresponding recess on the BackPac (Fig 2-L).
- 4) Pick up the BackPac. Please note the Jasmine serial number, which is located on a tag in the lower right-hand corner of the inner side. Write this number down on page ii of this manual and also on your invoice. If you ever need technical assistance, you will be required to provide this Jasmine serial number to our technical representative.
- 5) Align the BackPac as shown in Figure 1. Grab each BackPac screw (Fig 1-C) by its head and pull gently until it stops sliding. Do not pull the screws all the way out of their housings.
- 6) Position the BackPac close to the back of the Macintosh. Take hold of the SCSI port adaptor (Fig 1-F) and gently plug it into the Macintosh SCSI port. Make sure the lower plastic guides (Fig 2-P) of the BackPac are resting in the Macintosh case screw recesses (Fig 1-A).
- 7) Align the AC power receptacle (Fig 2-J) next to the Macintosh power input socket (Fig 1-D). Press gently. It should fit snugly.
- 8) Press the upper right-hand side of the BackPac against the Macintosh. The BackPac plastic clip (Fig 2-K) should "snap" into the opening located within the recess of the battery compartment (Fig 1-G).

9) Tighten the BackPac screws (Fig 1-C) *by hand* as much as possible, then use a coin to complete the installation. *Never use a screwdriver.*

10) Tighten the SCSI adaptor screws.

11) Plug the Macintosh power cord into the power socket on the BackPac (Fig 1-D). Plug the other end of the power cord into a three-hole, *grounded* outlet.

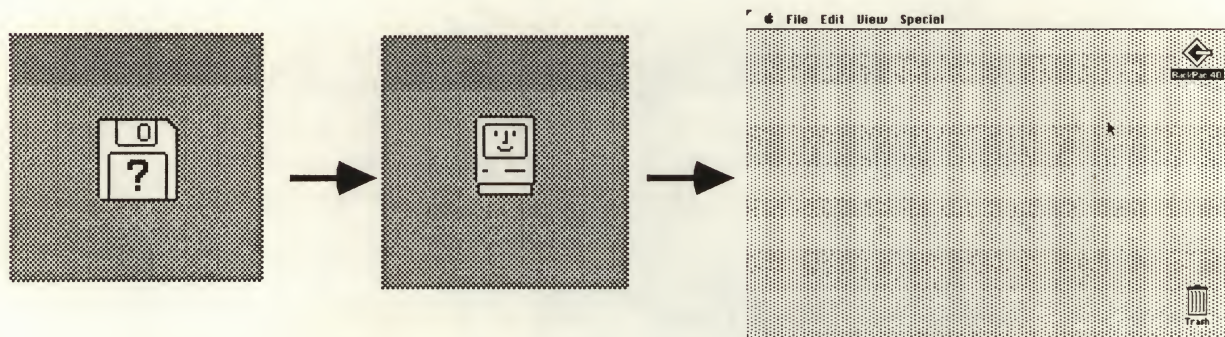
The installation is complete.

Power On!

Turn on the BackPak. The power switch is located in the upper right-hand corner (Fig 1-E).

The BackPac and the Macintosh will simultaneously turn on. Once the drive comes up to full speed and runs it's internal diagnostics, it is ready to go to work.

The usual icon of a disk with a blinking question mark should quickly turn into a smiling face, thus indicating that the drive is booting up. Within a few seconds, you will see the BackPac icon in the upper right corner of the screen. This indicates that the drive is intact and ready to go to work for you.



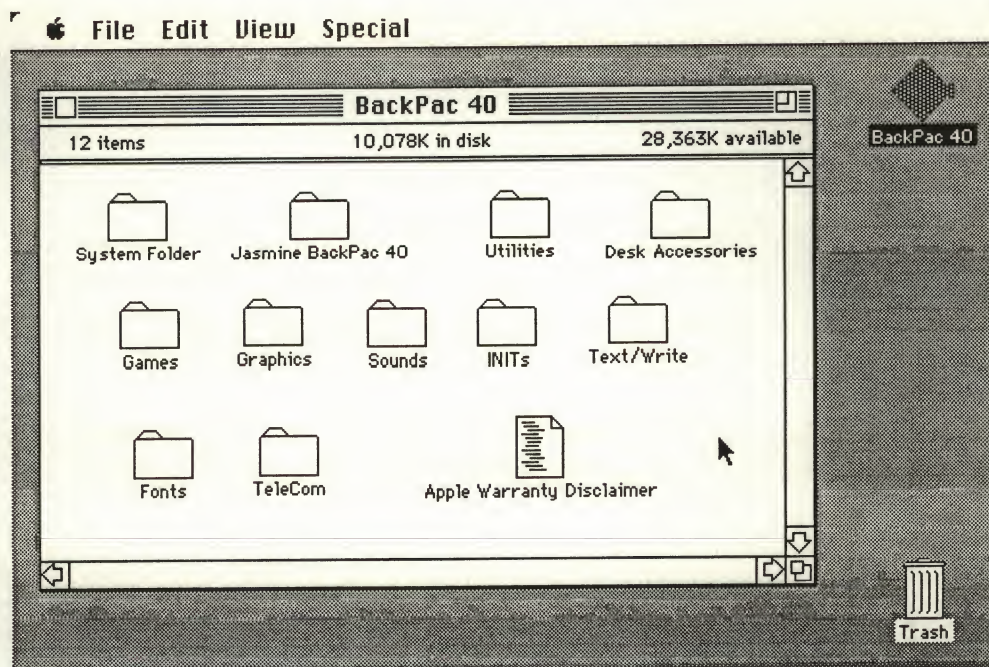
If the above fails to occur, check all your connections and make sure everything is turned on properly. Reset the Macintosh. If the BackPac still does not boot, consult Chapter 11 on TroubleShooting. If you need further assistance, call our Technical Support line. (The number is listed in the front of the manual.) We will help you discover what is amiss as quickly as possible. Most problems can be corrected in just a few minutes.

On the Desktop

Your screen should now be displaying the Macintosh desktop with two icons: the BackPac icon and the "Trash".

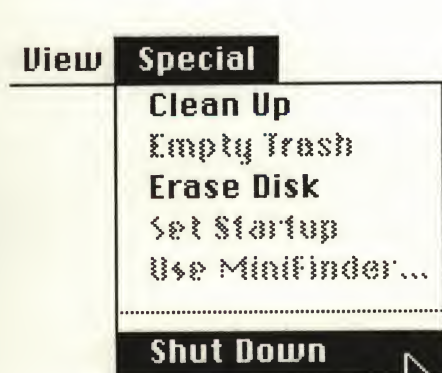
Double click on the BackPac icon.

A window will open displaying icons which represent the contents of the drive. Chapter 2 will briefly describe the contents of the folders on your desktop.



Power Off

At the end of a work session, come back to the desktop level. Choose Shut Down from the Special menu.



System 3.2/Finder 5.3



System 4.1/Finder 5.5 (or greater)

This allows any necessary data, such as desktop changes, to be saved on the BackPac (and on any inserted floppy disks).

Under System 4.1/Finder 5.5 (or greater), choosing Shut Down from the Special menu presents a dialog box which states: "You may now power off the computer safely." Now turn off the BackPac. The Macintosh will also power down.

Under System 3.2/Finder 5.3, shortly after choosing Shut Down the screen will clear and the Macintosh will "bong". *As soon as you hear the Macintosh "bong", turn off BackPac.* As mentioned above, the Macintosh will also power down from the same power switch.

Final Notes

In order to insure the proper functioning of the BackPac, please be aware of several areas of immediate concern. They are all covered in depth in subsequent chapters.

Do not use copy protected software on the BackPac. See Chapter 5.

If you are planning to use the BackPac in a foreign country, please contact our office first. See Chapter 10.

Thank You

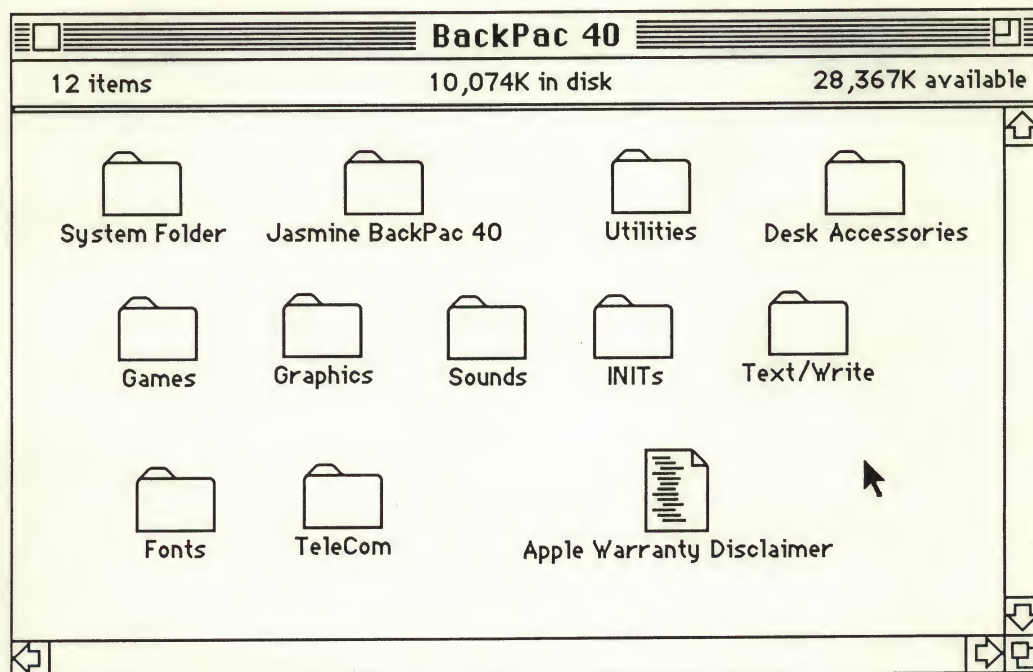
Once again, thank you for joining the world of Jasmine. Enjoy your drive and keep in touch with us. We like to hear from our customers, as your feedback can help Jasmine continue to be a leader in the Macintosh SCSI market. We have many new, exciting products in the works.

Chapter 2 - Software Included With the BackPac

We have loaded the drive with software as a service to you. Some of it is completely free and is distributed in the Public Domain; however, many of the programs are not free and are classified as "Shareware", which is discussed below. We do not charge for the software on the BackPac. You are *not* considered a registered owner of any of the Shareware unless you pay the registration fee.

Back It Up

We recommend at this point that you back up all the software on the drive. *Do it now!* We believe that the most reliable backup method is to copy files, a few at a time, from the desktop over to floppy disks. We are aware that this method is slow and tedious; however, considering the present alternatives, we feel it worthwhile your time and effort. See Chapter 6 for a discussion of backup methods.



Now that you have backed up the software, please review the folders, saving those files which may be useful and discarding those which you will not presently need. You will shortly be transferring your own software over to the BackPac, and, depending upon the size of your software library, free space may become scarce!

The System Folder

The System file is the most recent (at time of shipment) Macintosh System file released by Apple. We have also installed the DA "Find File", which searches for a particular file on the hard drive.

The Font/DA Mover is a very useful utility from Apple. It allows you to customize your System file by installing/removing fonts and desk accessories. See Chapter 4.

The "Jasmine BackPac 40" Folder

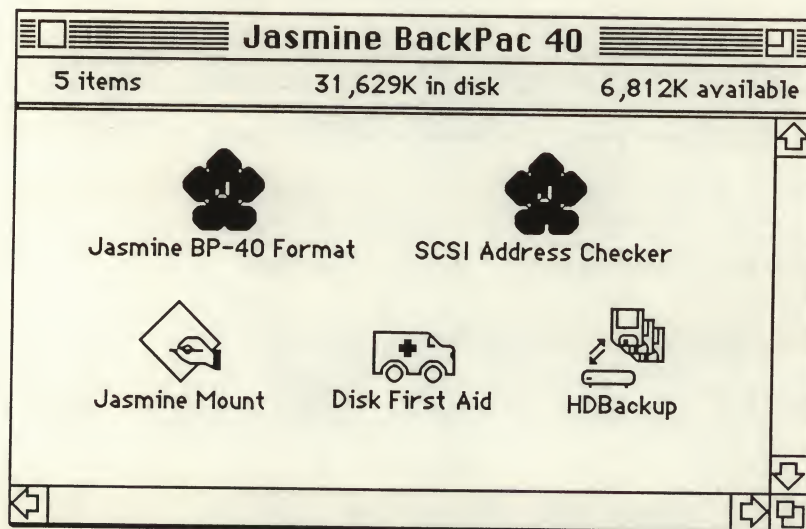
The Jasmine Folder contains our proprietary formatting software and some diagnostic tools to help you recover and salvage a problematical drive. A copy of this folder is also on the floppy diskette we included with your BackPac. We *recommend that you make extra copies of this disk and store them in a safe place.*

"Jasmine BP-40 Format" is discussed in Chapter 8.

"Jasmine Mount" and "SCSI Address Checker" are discussed in Chapter 7.

"Disk First Aid" is a very helpful application which diagnoses and repairs certain problems which may occur with not only hard drives but also floppy disks.

"HD Backup" is an application which backups up and restores the contents of a hard disk.



The Public Domain and Shareware Library

The library of software that Jasmine places on your drive is as current as possible. It is composed of many programs that are public domain and also a variety of Shareware programs. We have organized these programs into folders according to their primary purpose. Some of them include separate documentation; others provide online help. With a little experimentation, you should be able to ascertain how to properly use these programs.


If you want to learn more about these programs and obtain other similar software, we suggest joining a local user group. User groups can be an excellent source of information about software, hardware, etc. They can also arrange for group purchases of Macintosh products and make presentations of new products.

Shareware Programs

The concept of Shareware was created a few years ago as an alternative form of software distribution. Essentially, the shareware author encourages people to copy his program and give it to others. Users are allowed to use the program for a limited amount of time, and then, if they find it useful, they are asked to send the author a "registration fee". Otherwise, the program should be removed from your software library.

DiskInfo™ is distributed on the honor system. If you find it useful, please send \$10 to:	
Maitreya Design POB 1480, Goleta, CA 93116	
Memory: 1522K free of 2048K	<input type="button" value="Make Default"/> <input type="button" value="Show Files"/>
	<input type="button" value="Unmount"/> <input type="button" value="Find..."/>

Artisto	
Open	⌘O
Show Page	⌘P
by Tom Taylor	
ShareWare	
Please send donation to:	
3707 Poinciana Dr. #137	
Santa Clara, CA 95051	

by David Dunham ©1986 Maitreya Design version 1.3/12Dec86

miniWRITER™ is distributed on the honor system. If you like it, please send \$12 to: Maitreya Design PO Box 1480, Goleta, CA 93116

Shareware offers significant advantages over commercial software; prices are usually much lower, there is no copy-protection, and the user is given the opportunity to try a program before purchasing it.

There is a rich assortment of shareware programs available for Macintosh users. However, the whole shareware concept is being threatened by the failure of people to send in shareware fees. *Please support Shareware software.* It is a valuable source of Macintosh software. If these programmers are not supported, they will be forced to use a more conventional distribution channel -- commercial software -- resulting in higher prices to the user. An even worse consequence is that some of these programmers may stop writing programs for the Macintosh altogether. That would be most regrettable, as software is the lifeblood of the Macintosh.

Note: Do not assume that, because you have paid for your BackPac, you are now a registered owner of the shareware software on the drive. We load the software on the hard disk as a service to you. The public domain software is free. The shareware software is not free. If you decide to keep any of these shareware programs, please send in the appropriate registration fee.

Jasmine Disclaimer

We have done our best to ascertain that all the software we place in the Public Domain and/or Shareware folders is in fact PD or Shareware. Please notify us if you feel we have included a program that does not belong within these two categories. Jasmine does not guarantee that all the software works, although we have tested as much of it as possible. We do not sell any of the software provided unless specifically mentioned as Jasmine software.

Note: Shareware Authors -- If you have written a program which you would like distributed as shareware on our drive, feel free to send it to Jasmine for review. If you distribute your software by shareware and do not wish your programs to be distributed by Jasmine, please notify us. We will remove your software from our drive.

Chapter 3 - Files, Folders, and Storage Areas

This chapter will suggest ways to organize data, to arrange folders, and to efficiently use all the new storage areas. We will begin with a brief review of filing systems. If you are not acquainted with the concepts of creating and using folders, please read and become familiar with the pertinent sections of your Macintosh manual. We will try not to take too much for granted and yet still offer a comprehensive overview of the Macintosh in relation to hard disk drive mass storage.

MFS

When the Macintosh was first introduced it used the Macintosh File System (MFS). For a while MFS worked well, as the only storage devices available were floppy disks. There are only so many files one can store on a 400K or 800K diskette. MFS allowed you to organize the visual look of your desktop with folders; however, these folders were really only "desktop cosmetics". That is to say, the Finder never really "recognized" the folders but rather only "saw" a list of files. (Note: The Finder, located in the System folder, is an application the Macintosh uses transparently to organize and manage files.)

For example, suppose you are using MacWrite™ and wish to find a document written several months ago. Furthermore, suppose that previously you created four folders, naming each after a fiscal quarter of the year, and stored all your business documents written in the first quarter in the "First Quarter" folder, second quarter's correspondence in the "Second Quarter" folder, etc. Now, to find a specific document, you choose Open from the MacWrite File menu and a standard file dialog box appears.

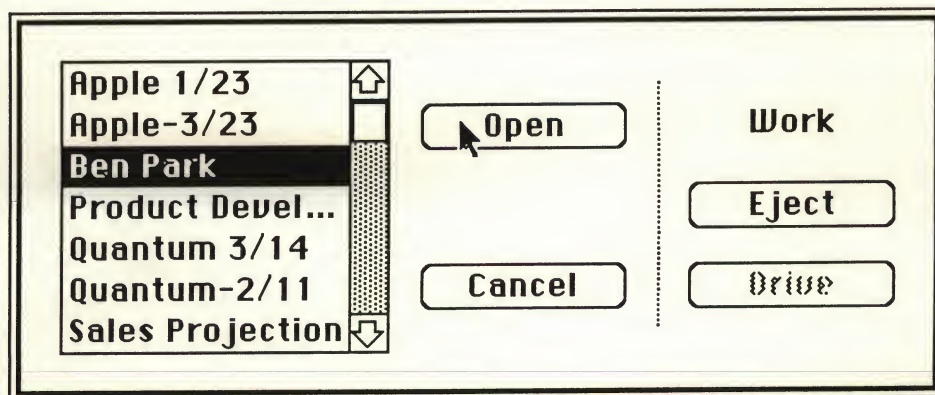


Figure 1

Under MFS, there would be an alphabetical listing of all the documents on the disk. It's as if the folders do not exist. They are only cosmetic.

The advent of large storage devices strained the capabilities of MFS. Now it was possible to store hundreds, even thousands of files on a hard drive. The Finder slowed down significantly trying to keep track of so many files. And consider the MacWrite example above. It became a very tedious task scrolling through hundreds of file names in the file dialog box looking for a specific document.

HFS

With the Hierarchical File System (HFS), the Macintosh now has the ability to store files in a hierarchical method in a treelike structure.

Consider once again the example in the previous section. You are in MacWrite™ and wish to find a particular document written in the first quarter of the year. To emphasize the point, let's assume that within the four quarterly folders you have stored several hundred files. Choose Open from the File menu and the standard file dialog box appears. Under MFS (figure 1) every document is displayed. Under HFS (figure 2a) you are presented with a list of folders*.

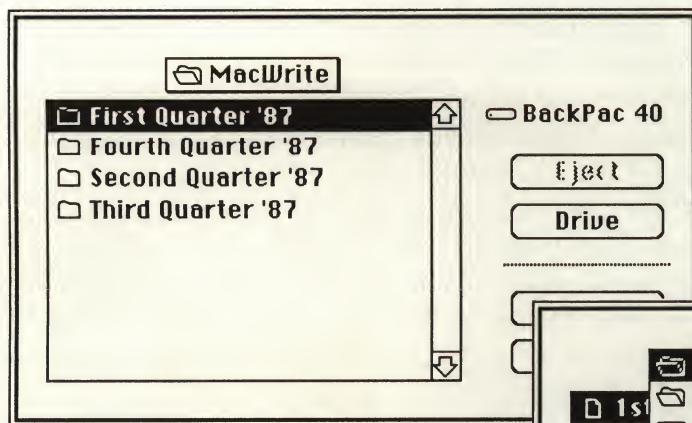


Figure 2a

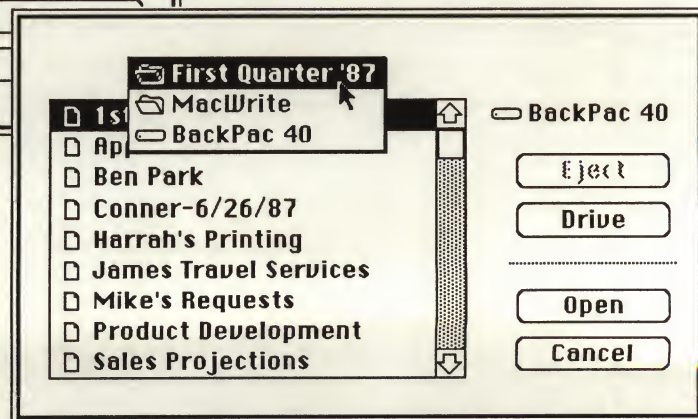


Figure 2b

By double-clicking on the "First Quarter" folder, the dialog box will now present you with a list (figure 2b) of the files stored *only* in that folder. Thus you will only need to scroll through this one folder's directory to find the document in question. This kind of folder organization greatly facilitates locating files and helps to speed up the Finder.

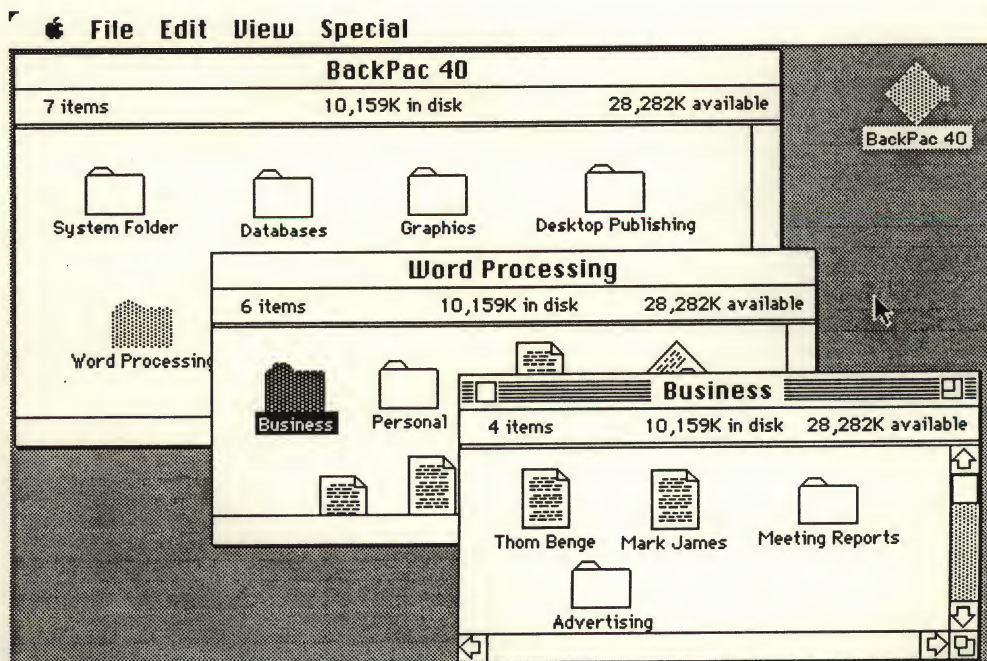
*Note: In the interest of clarity, we are assuming that there are no other folders on the drive. If there were, they would also appear in the dialog box.

Organizing Folders

The fundamental storage unit under HFS is the folder. A folder can hold any number of items, with any combination of files and/or folders. In each folder you can place more folders (nesting), and so forth, having multiple levels of storage depth and thus creating a certain hierarchy of files. HFS will allow you to layer (nest) the folders into more than 50 logical levels of storage, with as many items as you desire in each level (assuming there is storage space available).

If you have not used folders in the past to organize your files, start now. Folders are critical on a hard disk. Learning to use folders properly can save you time both in searching for files and in minimizing clutter.

When setting up your BackPac for your working environment, try to plan ahead a bit. There is no perfect way to organize folders. We would like to suggest one scheme which organizes folders according to the nature of particular tasks. For example, create a folder titled "Word Processing" and store all such related files/programs in it. Nest several folders *within* the Word Processing folder. For example, create a folder for business correspondence, another for personal letters, etc. Then within the business folder you may wish to nest more folders to categorize the correspondence further. You may wish to create totally separate folders for Graphics, Databases, Programming, Entertainment, Desktop Publishing... whatever.



Another popular scheme is to organize folders around different applications. So you might have a MacWrite™ folder, a PageMaker™ folder, etc. After a little experimentation you will be able to create a hierarchy which best suits your needs.

Partitions

When MFS was the only filing system, some hard disk vendors offered utility software which would partition the hard disk into volumes. The Finder treated each volume (partition) as if it was a separate disk. Thus, by only mounting (bringing to the desktop) needed volumes, the remaining volumes were, in effect, hidden from the Finder. And since the Finder then had fewer files to manage, it worked much faster.

With the advent of HFS and the true hierarchical nature of folders, there is currently less need to partition a hard disk. However, there are times when partitioning may be desirable. If you have very sensitive files stored on a hard disk at work, storing these files in a password protected volume would effectively limit access to authorized people only. If the hard disk is being used as a file server, the need for this type of setup is even more pronounced, as many people will be accessing the drive. Also, the performance on large capacity hard drives (50 megabytes and above) may improve through partitioning.

If you wish to partition the BackPac, there are programs available which are capable of creating variable size partitions with password protection. Some will even create MFS volumes. This is particularly useful if you have software which will not work properly under HFS. Try creating an MFS volume and running these programs from it.

Chapter 4 - Customizing Your System File

The Font/DA Mover is an application for customizing your System file, i.e., installing/removing desk accessories and fonts. If you are not familiar with the uses of the Font/DA Mover, please refer to the pertinent section of your Macintosh manual. Remember: a desk accessory file has a distinct "suitcase-like" icon. To use a desk accessory or font, it must first be installed in your System file.



Find File

Desk Accessory File



Geneva

Font File

One of the real advantages of using a hard disk is that it allows you to add many fonts and desk accessories to your System file. Because of the limited amount of storage space on a diskette, it is often impossible to have available all the fonts and desk accessories you wish to use.

Perhaps an even more important advantage, however, is that you are working with the same System on the same drive at all times. The installed desk accessories *and their related data files* are always available to you. Why is this significant? Imagine trying to effectively use a calendar-type desk accessory with floppy disks. Each time you make an entry with the calendar DA, that information is stored on the startup disk. If you make different entries on different startup disks, you will soon find that the only way to check all your appointments is by checking all your different startup disks. No such problems arise with a hard disk, as the related data files are always available.

Using the Font/DA Mover

We have included the latest version of the Font/DA Mover in the System Folder on the BackPac and also on the Jasmine BP Disk. You can install up to fifteen desk accessories in the System file. There is no "official limit" as to the number of fonts you can have in the System file, but *we recommend installing no more than twenty-five fonts.*

If you are going to make *major* modifications to your System file, we suggest you do so from a floppy disk. When Apple first introduced the concept of desk accessories, the largest DA was no larger than 10k bytes. Today some DA's "weigh in" at over 90K bytes! Some of these large desk accessories *may* conflict with other DAs. Copy a current System and Finder onto a disk and make all your desired modifications.

Boot up the disk a few times and make sure all the DAs work properly. Then it should be safe to replace the old System on the hard disk with the newly modified System. Remember: Boot up with a floppy first, as you will be unable to replace the System on the hard disk if it is the startup System.

Note: Never have more than one System and Finder on your hard disk.

Never!

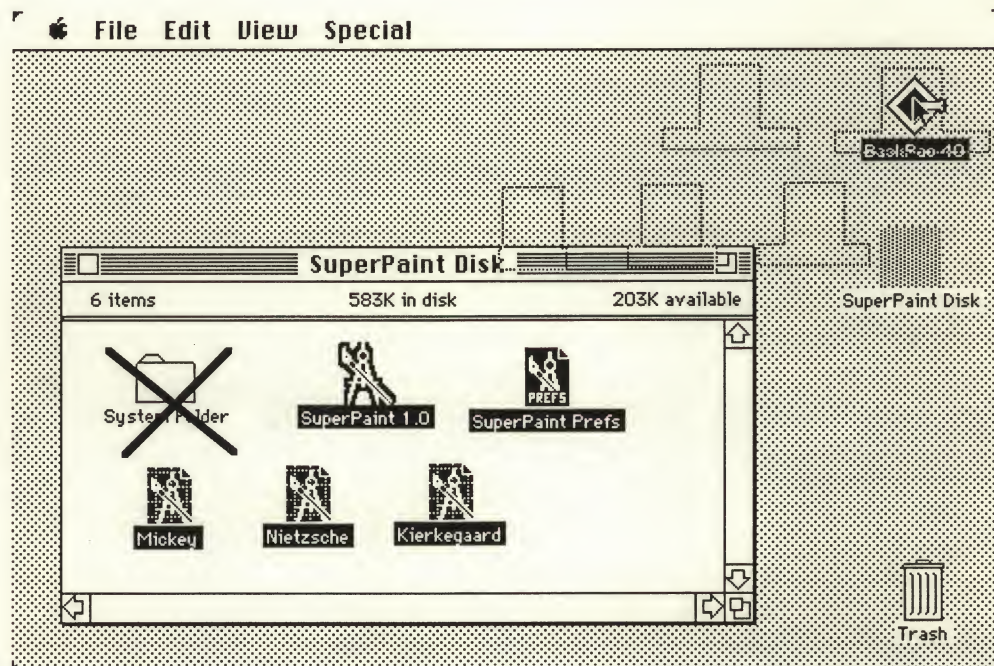
Installing Desk Accessories In An Application

Desk accessories are usually installed in the System file. You may find that there are certain desk accessories which you only use with certain applications. There is a way to install these application-specific DAs *within* the corresponding applications and thus free up your System file for other DAs.

Open the Font/DA Mover and select the DA mode. First open the DA file you wish to install. Hold down the Option key and click on the Open button located below the destination window. Select the appropriate application and then copy the DA over to it. A desk accessory so installed will only appear under the Apple menu when the application is opened. This allows for the installation of more general kinds of DAs in the System file. Now, whenever you are in that application, there can be more than fifteen DAs under the Apple menu -- the maximum of fifteen from the System file plus however many DAs are installed in the application itself!

Chapter 5 - Copying Files to Your BackPac

Copying files to the BackPac is *essentially* the same as copying files from one floppy disk to another. Insert the disk you want to copy, double click on the disk icon, select those files/folders from the disk you want to transfer, and then drag them to either the hard drive icon or the drive's directory window.



Do not simply drag the floppy disk icon over to the hard drive icon. The entire contents of the disk will be copied over to the drive and placed in a folder named after the disk. *You may inadvertently copy over a System file or Finder from the floppy disk.*

Never have more than one System and Finder on your hard disk.

You must also watch for a situation in which you attempt to copy a *folder* over to the hard disk and are presented with a dialog box that asks: "Replace items with same name with selected items?" If you click "OK", *all* the files *in* the folder on the hard drive will be erased, and then the files from the folder on the diskette will be copied onto the drive. For example, on the hard drive you have a folder titled "Graphics" with ten MacPaint files. On a floppy disk you have a folder titled

"Graphics" with one MacPaint file. If you copy this latter folder over to the drive, clicking "OK" when the dialog box appears, the Finder will erase the ten MacPaint files and copy the one file from the diskette into the Graphics folder on the drive.

Warning! -- Copy Protected Software

Improperly installed copy-protected software can significantly interfere with the operation of any hard disk drive.

There are two "acceptable" methods for transferring a copy-protected program onto a hard disk:

(1) Drag the icon representing the program onto the drive from the master diskette. In most cases you will then be required to insert the master disk each time you open the program from the hard drive. Note: Some copy-protection schemes will not allow you to copy the application to another disk. Other schemes allow you to copy the program to another disk, but then proceed to damage your data when the application is run. Please consult with your software vendor.

(2) De-protect the program. There are currently programs which effectively remove copy protection from most major software. Two such programs are Hard Disk Utilities™ by FWB Software and MacZap™ by Micro Analyst Inc.

Utilities that install copy-protected software *without* removing the copy protection should be avoided. While some companies have now made provisions to allow a limited number of transfers of their software to a hard disk, this scheme may ultimately lead to frequent and often deadly data corruption as, in effect, *the copy protection is being moved along with the application onto the drive*. Note: In rather simplistic terms, a "corrupted file" means that the form in which the file data was stored on the storage medium has been altered to such an extent that the file is no longer "readable".

Note: If you use Copy II Hard Disk™ to transfer copy-protected programs over to your hard drive, make sure it is version 6.4 or greater.

Chapter 6 - Backing Up Your Files

The Facts of Life

"Real men don't back up their drives." These prophetic words were allegedly whispered by Steve Costa, Berkeley Macintosh Users Group Software Librarian. Of course, maybe Steve can say this, as he is an expert at recovering files (see Chapter 12). However, most of us are not so gifted.

Back up your software!
Back up your software!

Many people use their software for long periods of time without ever backing up their work. Do not get into this poor habit, as it is just like driving an automobile without insurance. If you value your work, back it up. There are four primary methods of backing up software.

Backing Up to Floppy Disks Using the Finder

This is the simplest, most reliable, and, for most applications, the quickest method for saving your most *recent* work. We recommend you make this a daily habit.

At the end of a work session insert a disk you want to copy to. Select those files on the hard disk which you wish to back up. (Note: Holding down the Shift key while you click will allow for multiple file selections.) Drag the selected files over to the floppy disk. It's that simple.

If you want to back up more than 800k bytes of data, this will require additional floppy disks. Using this procedure for a complete backup may be rather time-consuming and tedious; however, considering its high degree of reliability, we believe backing up to floppy disks using the Finder is the best hard disk backup method presently available.

Technical Note: Another advantage of this backup method is that files copied by backup programs are verified only once while files copied using the Finder are verified three times.

Backing Up to Tape Drives

Tape backup is a convenient method of backing up your hard drive, as it is relatively fast and effortless. However, considering the *present* state of technology in this area,

we cannot in good faith recommend this backup method. After speaking with experienced users and reviewers, tape backup programmers, and those experienced with tape systems, we feel that today's tape backup systems are still unreliable.

It may be that presently there is no truly reliable tape backup system for any microcomputer, let alone the Macintosh. Jasmine is conducting research in this area. If you need a tape system and cannot wait for something better to become available, we recommend a streaming system over a cartridge system. Make your dealer prove to you that it works to your satisfaction.

Backing Up to Another Hard Disk

Evidently few people have considered using a hard disk to back up another hard disk. Perhaps until now this backup method seemed ludicrous because of the cost factor. However, considering the new industry pricing levels initiated by Jasmine, this option deserves a better look.

How would it work? Simply connect another hard drive to the drive you want to back up (see Chapter 10 for details on daisy chaining). Then drag all your files over to the backup hard drive. Fast... simple... reliable.

Using Backup Software

Backing up the entire hard disk or large portions of the drive onto floppy disks is made much easier with the assistance of a backup program specifically designed to aid in that task. Some of these programs present various options for backing up selected files; for example, you can back up files by class (application, etc.), by date (modified/created before/after a certain date), by name, by changes since last backup (incremental), etc.

Each of these packages includes a manual which should guide you through the proper use of the program. We would like to simply offer some general tips. Initialize the backup diskettes in advance, even if a particular program does not require this, as one bad floppy disk could ruin your whole backup. Also, verify the diskettes if that option is available.

If you wish to be extra cautious, when the time arrives to back up the hard disk *again*, use a second set of floppy disks. Then, when it's time to back up again, re-use the first set of disks. Continue alternating the two sets. This will limit the file loss should one of the backup sets fail to restore properly.

HD Backup

You will find HD Backup in the Jasmine Folder, which is located on both the BackPac and the Jasmine BP Disk. It is a straightforward application which will assist you in backing up the contents of your hard disk.

On opening HD Backup, the following dialog window appears:

HDBackup ver 1.0

Message:
Select a volume and a function, then click OK when you are ready to proceed.

Volume:
☐ Home 38003K
☒ Work 16694K

Function:
☒ Back up all files.
☐ Back up changed files.
☐ Back up a single file.
☐ Restore all files.
☐ Restore a single file.

Percent complete: 0 25 50 75 100
Sides required:

Quit Cancel OK

© 1986 by PBI Software.

The "Message" box continually prompts you with instructions. When the copying begins, it keeps you advised as to the status of the backup procedure.

Global Backup: First choose the appropriate hard disk in the "Volume" box. Then choose "Back up all files" in the "Function" box. Click OK.

Message:
Please insert the next disk to be erased and filled.
The disk will be named:
"1.Work".
WARNING: All information on the inserted disk will be destroyed.

The Message box instructs you to insert the first disk. If the diskette has not been initialized, you will be given the option to either eject or initialize it. (If you want to format a disk that has already been initialized, hold down the Option key as you insert the disk.) HD Backup names the disks in numeric sequence followed by the name of the hard drive being backed up. In the above example, the first disk would be named 1.Work, the second disk 2.Work, etc. Once the first disk is full, HD Backup will automatically eject it and then request another disk, and so on. Label the disks as they are ejected; otherwise, you may lose track of their numeric order.

The Message box will advise you when the hard drive is completely backed up. Now click OK and Quit.

Incremental Backup: At regular intervals it is advisable to back up your hard drive. Since you have already made a global backup, it is only necessary to copy those files

which have been modified or added since your last global backup. This procedure is almost identical to that of the global backup. Choose the appropriate drive, then select "Back up changed files" from the Function box. Click OK and once again follow the prompts of the Message box. Make sure to distinguish these disks from your global backup disks by labelling them as incremental backup disks.

Single File Backup/Restore Options: If you ever wish to back up a single file which is too large to be copied with the Finder onto a floppy diskette, use the "Back up a single file" function.

Select the appropriate hard drive, choose "Back up a single file", then click OK. A standard file dialog box will appear. Choose the large file you wish to copy and click Open. Follow the familiar prompts from the Message box.

HD Backup restores a single file to your hard drive without erasing other files on the disk. Choose "Restore a single file". Make sure to select the volume to which the file is to be restored. Click OK. Insert a backup disk. A standard dialog box appears. If you cannot locate the file you wish to restore, click on the Eject button, then insert another disk and continue searching. Once the file is located in the directory, open it. HD Backup now copies the file to the hard drive. If the file was split over another disk during backup, HD Backup, after copying the first disk, subsequently asks for the second disk so as to complete the restoration.

Restoring All Files: If you ever need to replace *all* the files on your hard disk, use HD Backup to copy the files from your backup disks to your drive.

Copy HD Backup to a floppy startup disk and boot up the the diskette before the hard drive you wish to restore. Open HD Backup. Select the drive you want to restore and choose "Restore all files" from the Function box. *If you continue, all data on the selected hard disk will be erased.*

Click OK to continue. The Message box prompts you for each backup disk. Insert them in the proper numeric order. Any disks inserted in the wrong order or belonging to a different backup set are ejected. Once all the global backup disks are copied, insert any incremental backup disks (once again in the correct order).

If there are no incremental backup disks, click Cancel after the last global backup disk is copied, then Quit. If there are incremental backup disks, after the last one is copied, the Message box advises that the global restoration is complete. Click OK, then Quit.

Chapter 7 - Jasmine Utilities

Jasmine Utility Software

Jasmine has included two proprietary utility programs which will help you in the proper use of your BackPac. They are located in the "Jasmine BackPac 40" folder, which has been placed both on your drive and on the Jasmine BP Disk.

Jasmine Mount

Certain situations may arise which necessitate the mounting of the hard drive. (Note: Mount in this context means bringing the hard disk icon "to the desktop", which usually indicates the files stored on the drive are now available.) There may be occasions when you begin a work session without turning on the BackPac, and subsequently, you wish to install it onto the desktop without powering down and restarting. However, the Macintosh will only look to see what devices are connected to it on startup, so it will not "recognize" the hard drive if you simply turn it on. Running the program titled "Jasmine Mount" should mount the BackPac. In fact, this program will mount all devices which are properly connected to the SCSI bus and turned on.

This utility is also very useful when you are experiencing certain problems with the hard drive, such as a malfunctioning (corrupted) System file. How does a System file become corrupted? By using copy-protected software on the drive. By installing too many fonts in the System file. By severe fragmentation. As the result of a system crash. Unfortunately, the list goes on and on.

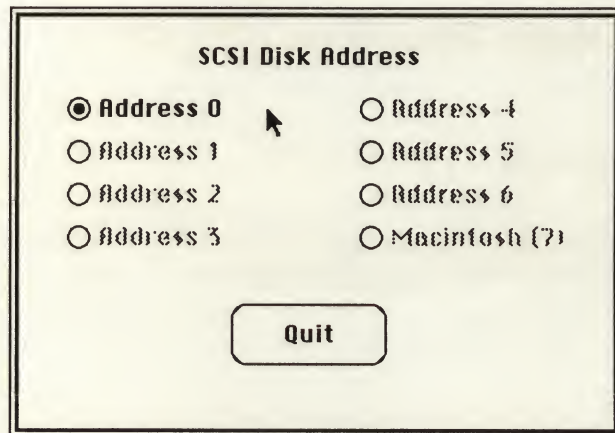
One symptom of a corrupted System file is that the hard drive may not boot up. You switch on the drive, wait ten seconds, then turn on the Macintosh, but the little "blinking question mark icon" never turns into a "happy face".

Insert the Jasmine BP Disk, open the Jasmine Folder, and double click on "Jasmine Mount". Often the hard drive will then mount, allowing you to replace the corrupted System file. (see Chapter 11 on TroubleShooting for further details.)

SCSI Address Checker

"SCSI Address Checker" will check to see if any SCSI devices are sitting off line (not mounted on the desktop). It will also show the corresponding SCSI disk numbers of any devices found off line.

This utility is provided to help in trouble-shooting a drive which fails to boot up. Running the SCSI Address Checker will give you an indication of whether or not the Macintosh is "communicating" with the hard drive. If the utility finds the drive on the SCSI bus, the following dialog box will appear:



The above screen indicates there is a drive connected to the Macintosh SCSI bus and it is *sitting off line*. "Sitting off line" means that the drive is not mounted on the desktop... that the icon representing the drive is *not* on the desktop. The SCSI Address Checker will not find the SCSI ID of a drive that is already mounted on the desktop. (see Chapter 11 on TroubleShooting)

Chapter 8 -- Formatting Your BackPac

This chapter teaches you how to format your hard disk and suggests when this should be done. We also discuss factors which determine drive speed, with an extensive review of the interleave factor. Even if you have very little "technical inclination", you may find this discussion to be quite interesting.

When to Format

The BackPac comes preformatted. However, there may be times when it is advisable to format the drive again. After a period of time hard drives may develop bad sectors. Our formatting procedure checks the platter for any bad sectors, and, if any are found, they are "locked out" so that data cannot be written to them. (Note: Data written to a bad sector is usually not readable.) Also, file fragmentation may occur after extended use. Formatting the drive will improve this condition. (See Chapter 9.)

Unfortunately, there are also occasions when severe file corruption, caused by any number of factors, will necessitate the reformatting of a hard disk. We say "unfortunately" because all too often the following sequence of events will occur: a user has not backed up his software... something happens which severely corrupts the System file/desktop file... the hard disk will not mount, so he is unable to back up his software... the only alternative is to reformat the drive, thus losing all his data. Remember: All data on the hard disk will be erased when you format the drive.

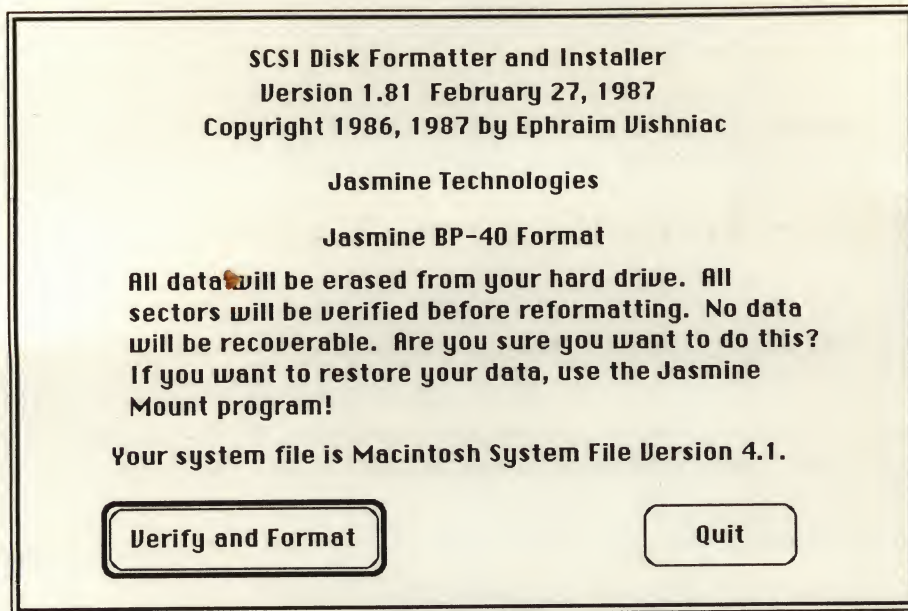
Jasmine Formatting Software

Located in the Jasmine Folder on the hard drive and also on the Jasmine BP Disk is our proprietary formatting program, titled "Jasmine BP-40 Format". It is not copy protected.

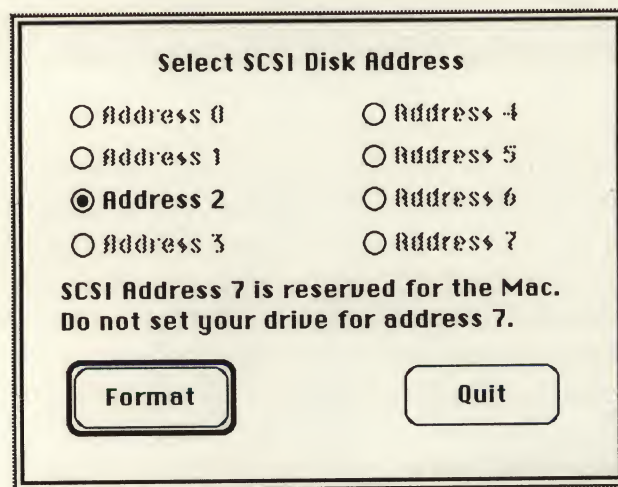
How to Format Your BackPac

Remember: *The formatting procedure will erase all data on the drive, so make sure your files are backed up.*

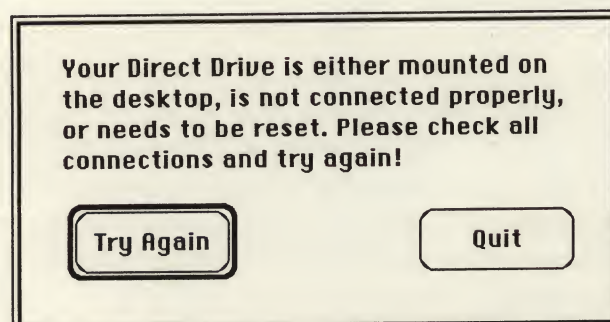
Insert the Jasmine BP Disk in your Macintosh and turn on the BackPac. The floppy disk will boot up first, followed by the hard drive. Drag the BackPac icon to the trash. This electronically unmounts the hard drive. The formatter will not allow you to format if the drive icon is on the desktop. Open the Jasmine Folder on the floppy disk and double click on the Jasmine format program.



Click on "Verify and Format". The following dialog window *should* appear:

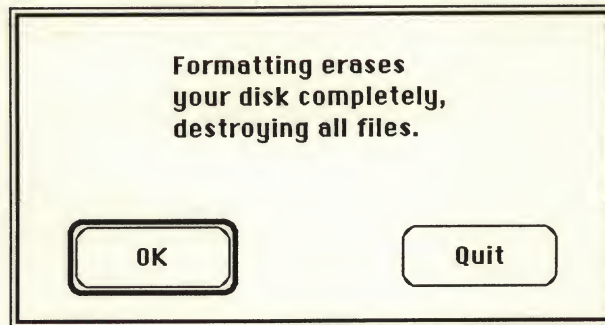


The above window indicates which hard drive is about to be formatted. If instead the dialog window below appears, first check your cables, then turn the drive off for a few seconds, turn it back on, wait ten seconds, and click Try Again.



If the "Select SCSI Disk Address" window still does not appear, choose Quit and check to make sure the hard drive is **not** already mounted; that is, the BackPac icon is not on the desktop. If it is, drag the drive icon to the trash and run the format program again; otherwise, consult Chapter 11 -- Troubleshooting.

Once the Select SCSI Disk Address window appears, click "Format". You will be given one last chance to stop the format procedure. If you continue, all data will be erased.



Click "OK". A last dialog window appears giving you the option to choose whether or not you want the disk "certified" before formatting. This procedure will check for any bad sectors and map them out. Click either "OK" or "Skip It".

When the drive has been successfully formatted, you will be so advised via a final dialog box.

When the formatting is done, return to the desktop, drag (copy) the System Folder located on the diskette over to the BackPac. Now choose Shut Down (Restart with Finder 5.4 or greater) from the Special menu. The Macintosh will eject the floppy disk and the drive will boot up quickly. You are now ready to copy your files back onto the drive.

Note: If you backed up all your files with a backup program, it is not necessary to copy the System folder from the diskette, as it will be restored from your backup disks. However, some backup programs do not re-write the boot blocks when restoring the System file; thus, the drive fails to auto-boot. If this occurs, delete the System file from the hard drive and copy another System over to the hard disk using the Finder. This will re-write the boot blocks.

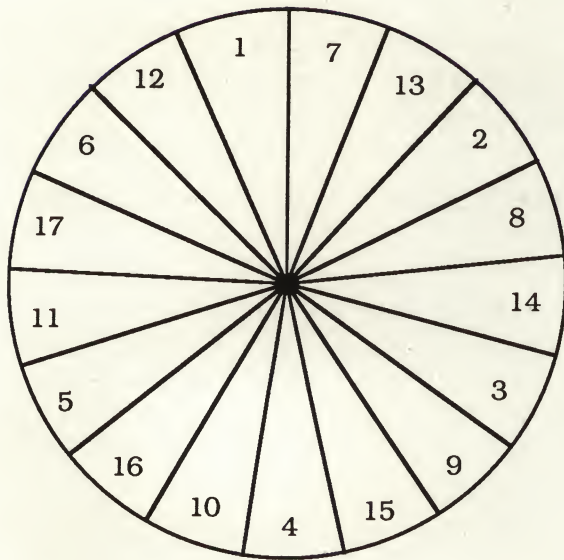
If you encounter an error message during the formatting procedure, try again. If the problem persists, contact the Jasmine technical support line. Write down the data sense numbers that the program provides. If you do not do this, we will not be able to diagnose the problem over the telephone. If you get a message that initialization has failed, try to format once more. Often all goes well on the second attempt and the drive will again be ready for use.

Technical Discussion

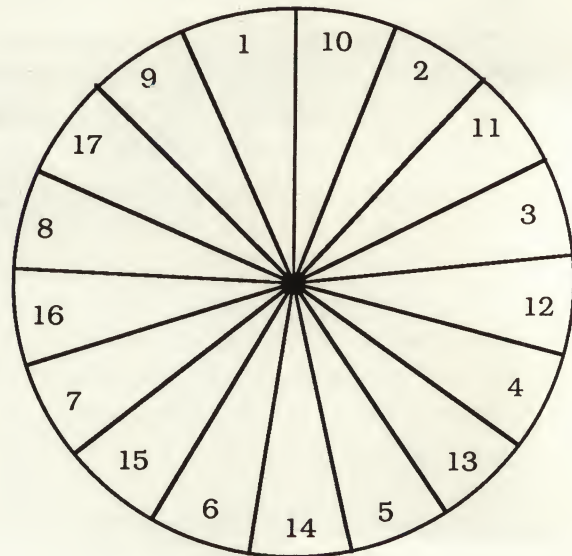
There are several factors that determine overall drive speed, and while access speed (how fast the drive head is able to move from track to track) is important, there is one factor, more important on a practical level, that can make a drive of average speed outperform a mechanically faster drive. It is called the interleave factor.

What is the interleave factor?

The interleave factor is the method and the arrangement in which data is laid out physically on the drive. To understand how interleave can affect drive performance, these two simple diagrams show two different interleave arrangements. They show how the disk drive platter is divided into sectors. Data is laid out into tracks that run radially around in circular form, with data being again divided into sectors on each track. This segmentation allows the data to be written into manageable chunks. The size of each chunk determines the size of the smallest file on a drive. Every drive is capable of supporting 512 bytes per sector.



Three To One Interleave



Two To One Interleave

Any storage device has to be designed for both speed and storage efficiency. Optimizing speed requires large blocks of information that can be read quickly, while optimizing storage requires data to be divided into small chunks. If one wishes to maximize speed, then each track would have only one sector of say 8,000 bytes in size, and each time the drive looked for data, it would load a whole track at a time. A single sector track would have a fast data transfer rate, but even a small file would take an entire track all to itself and much of the disk would be wasted space, especially when using many small files.

Optimizing storage would require very small data segments, such as 8 bytes per sector. This would allow much more data to be stored, and accordingly, performance

would suffer, as all the sectors have to be read and verified, and a large reference table is required to remember where all the data is kept.

A compromise is necessary, and the average file sector size on small capacity hard disk drives is 512 bytes. This means even small files take up data in 512 byte chunks. A track typically will contain 17 sectors, making for 8,702 bytes of information per track. Any file you may write has a minimum increment of 512 bytes of space, even if the file consists of a single digit!

When the disk drive head is told to seek for information, it takes a finite amount of time to read, verify, and send that information to the Macintosh, or the host computer. The disk drive is composed of several rotating platters with magnetic heads above each utilized surface. The platters are revolving at a high rate of speed, 3600 RPM or 60 revolutions per second. What occurs is that by the time the drive senses, reads, verifies, and sends the data to the host computer, the drive head has kept moving further across the track.

Typically a pattern is arranged where the data is not placed in continuous sequence on consecutive sectors. Instead, the data is staggered, where the sector with part one of a data string is placed one, two, or more sectors away from the second data string. The sector spacing between data chunks is called the interleave factor. If the interleave is one to one, this means that the information on a track is stored together, in order. If the interleave is two to one, then there is one sector in between each sector in a data string. A three to one interleave has two tracks in between the data strings, and so forth. Three and four to one interleaves are common on the Macintosh and most smaller computers, including IBM PC style computers.

The interleave number is also the number of times that the drive platter must rotate before the drive head is able to read all the data on a single track. Often the drive must rotate an additional part of a track to find the format line that marks the beginning of the track. If the interleave is set faster than the drive can send and read data, the computer is forced to wait an additional rotation for the proper sector to come around. Picture yourself waiting for your luggage at a rotating turntable in an airline terminal. Imagine waiting one slow rotation of the turntable for each of 17 pieces of luggage, as compared to removing all 17 pieces of luggage in a single rotation of the turntable.

The result in speed in different interleave ratios can be very significant. The performance of the drive must be closely matched to the performance of both the computer controlling the drive, the controller card, and the software driver that lays the data onto the drive. Most companies attempt to maximize performance on their product, which often results in a four to one or three to one interleave. In theory, most hard drive mechanisms are able to perform at a one to one or two to one interleave ratio, but the complexities of attaining that arrangement at an optimal performance level make it very difficult to achieve.

One additional reminder about the interleave factor. The interleave factor by itself is an arbitrary arrangement of data segments around the hard disk platter. What is

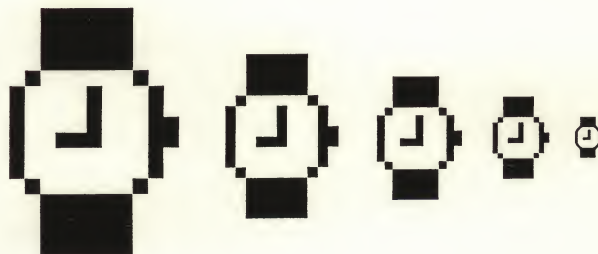
more significant than the interleave ratio is how the drive interfaces with the interleave to produce a relative increase in speed. Just setting the interleave at one to one without properly setting many other parameters in exactly the right manner will cause the drive to respond very slowly. This is why you may find hard disk drives on the market that perform reasonably well with a four to one interleave, as that company has found a combination at that interleave that they feel optimizes performance.

Chapter 9 -- Taking Care of Your Data

In Chapter 3 we suggested ways to carefully organize applications, files, paintings, etc. We pointed out that, by taking a few moments to logically nest levels of folders within folders, you could create a hierarchical system which would allow you to quickly find whatever file(s) you need. Organizing your files is one way of caring for your data. This chapter deals with a somewhat different aspect of "data care".

File Fragmentation

When information is stored on a hard disk, it is first broken down into "block size pieces" and then written to whatever blocks are available on the disk. Over a period of time, with the constant transferring of files to and from the drive, contiguous blocks may not be available to accommodate a whole program, so that program will end up being stored in many different areas of the disk. This is called file fragmentation. The result is a slower system, as the drive heads need to move to many different areas on the disk drive platters to load a particular file. If fragmentation is allowed to continue, not only will the performance of your drive slow down but eventually the Finder may lose track of some of the "pieces" and the file will may unreadable.



There are disk optimization programs (such as DiskExpress™ from ALSoft, Inc.) designed to remove file fragmentation by gathering all the "chunks" of fragmented programs and rewriting them in contiguous blocks. When writing back to disk, these programs will also prioritize your files, placing first those files which have the least potential for changing size, such as an application. This type of file order will help to slow down any future fragmentation of files. Because applications are usually left unmodified, they should be placed on the drive first. Documents, data, and other such files which by their nature will be continuously modified should be placed last.

What we recommend is that, after becoming comfortable with the drive and developing certain usage habits, reformat the drive and take the proper time in loading it as best as possible to maintain file integrity. To do this, back up your drive completely and reformat it. This will give you a clean slate to work from. Now copy the System Folder first. It becomes important to copy the System first, as you do not want it to get moved around by other files. Note: Try to stabilize your System file as much as possible; that is, decide which desk accessories and fonts you want to use and install them. Next load the applications that you use most often, such as MacWrite™, MacPaint™, etc. Then load utilities and other less often used software. After this is accomplished, you can load the rest of your data on to the hard disk. The purpose of this is to place the files and applications least likely to change in size at the beginning of the data storage area and those most likely to change at the end of the storage area. This will improve the efficiency of the drive and keep things running at a high speed. A drive that is heavily fragmented can cause a 50% or more increase in time loading files, running your software, and editing and writing files.

Rebuilding the Desktop

We must first differentiate between the "desktop file" and the "desktop". The "desktop" is what Apple calls the look of the Macintosh screen when a disk is first booted up. The icons represent files that are "on top of your desk". The "desktop file" is an invisible maintenance file found on every disk/hard drive. Icon images, Get Info data, and file and window locations (the look of the desktop) are examples of the types of data stored in it. When we say "rebuilding the desktop", we are referring to the desktop file.

When do you rebuild the desktop?

You may notice that the icons on the desktop will sometimes change in appearance. What was once a unique icon becomes a "generic" icon. This may be the first sign that things are going awry in the desktop management.

Watch for steadily slower drive performance, such as: a long time for a file or folder to open once it is double clicked; a long delay returning to the desktop level after quitting an application; slow booting up. Of course, adding more files to your drive will slow things down a bit, but it should not be that significant.

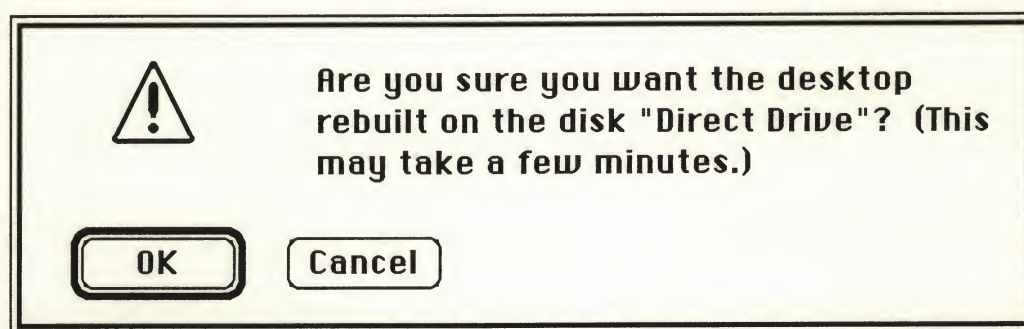
Generally, if you notice any "erratic behavior" or malfunction, we suggest rebuilding the desktop as a precaution. If dialog boxes appear which suggest something is wrong with the desktop management, for example, "disk is too full to record changes made...", then try rebuilding the desktop.

All hard drives normally require regular desktop file maintenance. As files are moved onto a hard disk, their unique icons are stored in the desktop file. However, when files are eventually deleted, their icons *remain* in the desktop file. If many files are being shuffled back and forth on the drive, the desktop file will steadily

grow in size. And since the Finder "reads" the desktop file every time you want to leave or return to the desktop level, things will eventually slow down, as the Finder needs more time to read the growing desktop file. When the desktop is rebuilt, these extraneous icons are deleted.

How do you rebuild the desktop?

As the hard drive begins to boot up (the blinking question mark turns into a "happy mac"), simultaneously hold down the option key *and* the control (clover leaf) key *until* a dialog box appears.



Click OK.

This procedure may take from three to twenty minutes, depending on how many files are stored on the disk. When the desktop is rebuilt, you will be returned to the desktop level. That's all there is to it. The hard disk will now be able to better perform at an optimal level.

We recommend that you rebuild the desktop every two to three weeks.

Never reset or turn off the Macintosh while the desktop is being rebuilt, as loss of data may occur. If the desktop file is severely corrupted, and if a large number of files are stored on the BackPac, it may take a half hour or longer to complete the procedure.

Rebuilding the desktop will delete any notes you may have written in the "Get Info" box of each file/folder.

Note: Proper shutdown of the Macintosh at the end of a work session will help insure the integrity of the desktop file. When you choose Shut Down (or Restart with Finder 5.4 and greater) from the Special menu, the desktop file is updated before the Macintosh resets.

Chapter 10 - Daisy Chaining Your BackPac

Understanding the SCSI Bus

SCSI stands for Small Computer Standard Interface. One of the advantages of the SCSI device interface bus is that it becomes very easy to connect extra devices up to the SCSI port. The SCSI bus can manage a total of eight devices, with the Macintosh computer counting as one of those devices.

We use the word "device" because hard drives are not the only things which can be connected to the SCSI port. Besides hard disk drives and tape drives, you will soon be able to hook up other computers, digitizers, scanners, voice synthesizers, and many other computer products. To be able to account for all combinations, we use the word "device" to mean anything that can be hooked up to the SCSI port.

Each SCSI device must have a *different* binary number associated with it so that the devices do not interfere with each other. Binary numbers look like this:

Number	Binary equivalent
0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111

Conventionally, this numbering system counts from seven down to zero. In the SCSI network, *the device with the highest SCSI device number gets priority whenever a search, transfer, or other communication occurs.* Therefore the Macintosh is assigned device number 7, the eighth device with the highest priority, thus becoming the master SCSI device and controlling all communications. What this means is that the SCSI network always searches device 7 first for instructions, then device 6, etc.

Each SCSI device connected to a Macintosh must have a unique SCSI ID number. This ID number must be between 0 and 6.

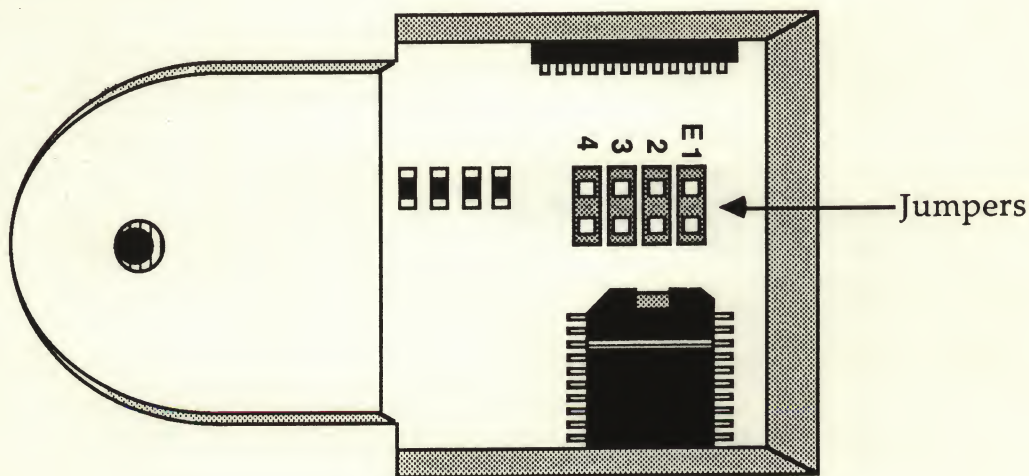
Connecting Another SCSI Device to the BackPac

The BackPac is terminated. To daisy-chain another SCSI device to it, you will need an additional cable. The end which connects to the BackPac SCSI port adapter should be a 25 pin SCSI connector. Check the other device for the specifications of its SCSI connector.

Make sure their SCSI ID numbers are *not* the same. The SCSI ID number of the BackPac 40 is set to five (5). If both SCSI devices have system files, the device with the higher SCSI ID number will boot up first, regardless of its *physical* position in the chain. This means that the BackPac will act as the startup device unless the other SCSI device is set to six (6).

Note: It is possible to have a device with a lower SCSI ID number act as the startup device without changing it's SCSI ID number. If you remove the System Folder from the device with the higher SCSI ID number, the drive with a lower SCSI ID number will be the startup device.

Note: *To change the BackPac SCSI ID number:* You will need to remove the BackPac from your Macintosh. On the "inner" side of the BackPac is a small, SCSI select door (see Chapter 1, Figure 2-N). Use a screwdriver to remove the door. Below is what you will see.



Each SCSI ID number requires a unique jumper configuration. Please refer to the table on the following page. For example, to set the BackPac SCSI ID number to 6, remove micro-jumpers "E3" and "E4" (using needle-nose pliers). To set the BackPac SCSI ID number to 3, remove micro-jumpers "E2" and "E3". And so on.

Jumper "E1" should always be left in. If you remove any of the jumpers, make sure to store them in a safe place. Please refer to Chapter 1 for re-installing the BackPac.

SCSI Device ID	MICRO JUMPERS		
	E2	E3	E4
0	IN	IN	IN
1	OUT	IN	IN
2	IN	OUT	IN
3	OUT	OUT	IN
4	IN	IN	OUT
5	OUT	IN	OUT
6	IN	OUT	OUT
7	OUT	OUT	OUT

E1 is parity check
IN = no parity
OUT = parity

Jumper Configuration

Consult the owner's manual of the other peripheral for the appropriate way to set its respective SCSI ID number. Remember: the SCSI ID number must be between 0 and 6 *and* must differ from the BackPac SCSI ID number.

Connecting More Than Two SCSI Devices to the BackPac

When more than two devices need to be connected to the SCSI bus, things become more complex. In order to better understand the situation, we include the following brief technical discussion.

Before the SCSI bus was defined, a company named Shugart and Associates created a fast, simple method of connecting their products together. They attempted to create a standard for the entire industry to follow. The American National Standards Institute (ANSI) modified the SASI (Shugart Associates System Interface) bus to allow for more flexibility, features, and other options that other manufacturers wanted. They named it the SCSI (Small Computer Systems Interface) bus.

As the industry matured, this bus underwent several revisions, and currently the SCSI bus is defined by ANSI specifications X3T9.2/82.2. All SCSI devices conforming to this definition or protocol are compatible with each other.

The SCSI Bus uses electrical current impulses to communicate. The SCSI bus must be terminated. What this means is that special *resistor packs* must be on the SCSI bus to "pull down" the signals to create enough difference between low and high as to give the computer and device the ability to recognize each other. These resistors are also needed to reduce or eliminate signal reflection, standing waves, and interference during communication. *The bus design requires one such resistor (termination pack) at the beginning and one at the end of the SCSI network.*

Because of this requirement, most devices come with termination installed into the device. This works fine with one or two devices; however, with three or more, problems occur because the signal increases in intensity with each terminator in the

chain. One terminator will create a signal at a level of "X", for example, while two will create 2 times "x level", or 2X; three will send 3X, etc., and all seven devices with resistors will create current levels that are seven times higher than the current level of one device. This signal level increase can and will eventually cause damage to the sensitive components in disk drives.

This is why there must only be two terminators in the chain -- one on the first device and another on the last SCSI device. Damage may result if more than two terminating resistors are connected in the chain. Because the terminators are required to operate a SCSI device, you will notice that disk drives will not operate without them, so most drives are shipped with terminators installed.

To add three or more SCSI devices to the Macintosh SCSI bus, the middle devices must not be terminated. If they are, consult their respective manuals for instructions on how to remove their terminating resistors. On our Direct Drive series, Jasmine designed a removable panel underneath the drive which will allow one to remove the resistors without opening the unit itself.

Considering that in operation it will always be attached to the back of the Macintosh, Jasmine terminated the BackPac. It will always be the first SCSI device in a SCSI network and thus must always be terminated.

The following are three "golden rules" for properly daisy-chaining SCSI devices:

1. All devices must have a *unique* SCSI number (0 to 6).
2. No device can have the designation 7.
3. The first and last SCSI devices in the chain must be terminated.

Some Tips and Advice:

Do not place two drives on a SCSI network with the same SCSI number. When you attempt to boot, they will both freeze. Upon reboot you may see a "sad Mac" or a frozen screen.

Never set the SCSI ID number to 7. Again, you may see a "sad Mac" or, more likely, up to seven disk icons on the desktop (when only one should be there).

Avoid having too much cable on your system. The recommended maximum length of cable seems to be about 19.7 feet, or six meters. Excessive cable lengths can cause reliability problems in reading and writing your data.

You should endeavor to obtain the same brand or type of SCSI cabling as much as possible. Each type of cable has different conductive characteristics which can cause interference or an electrical echoing effect. This, in turn, may result in data irregularities. Experienced consultants and dealers may have trouble locating problems caused from conflicting cable types. Though rare, this problem does occur occasionally in SCSI networks with multiple drives connected together.

To recap: Always arrange the SCSI network so that the first and last SCSI devices in the chain contain the terminating resistors. Never number a SCSI device "7". If the SCSI switch is placed on 8 or 9, it will respond as zero. When adding more devices later, connect them in the middle of your chain. The SCSI network can support modems, drives, tape backups, drives, and other possibilities.

Chapter 11 -- Troubleshooting

Perhaps because of their greater complexities (with their resultant superior capabilities), hard disk drives seem to have more "problems" than floppy disk drives. Files are constantly being moved on and off the drive, resulting in disk fragmentation (see chapter 9). Users become over-enthusiastic, creating humongous System files by installing many desk accessories and too many fonts! (see chapter 4). And hard disks seem to have a "knack" for giving the Macintosh Finder difficulties. They store a large amount of data, and the Finder can often get confused in the process of keeping track of thousands of files, icons, etc.

In this chapter we attempt to anticipate some of these problems and suggest ways to correct them. Below is a list of some useful utilities which may prove helpful in this endeavor. We are only providing short comments to assist you in deciding what you may need. If you use any of this software, thoroughly read their respective manuals beforehand. In the "Problems" section we discuss some common problems and suggest ways to correct them. If difficulties persist, contact our technical support staff for assistance.

Useful Utilities

- | | |
|-----------------|---|
| Disk Express™ | Helps diagnose drives, and repacks data so as to remove file fragmentation from your drive. Also prioritizes files.
Use version 1.1 or later. (ALSoft, Inc.) |
| HD Utilities™ | Removes troublesome copy protection from most software.
(FWB Software) |
| Disk First Aid™ | Very useful in repairing crashed data structure in floppies hard drives. (Apple) |
| Fedit Plus™ | Allows you to go into drive volumes and repair damaged areas, removing files that are causing problems. The best file editor.
(MacMasters Systems) |
| HFS Locater™ | A handy utility that allows you to find any file on the drive. It's a desk accessory which allows you to do many functions of the Finder from within an application, such as rename, copy, delete, launch files. (PBI Software) |

MacZap™	MacZap is an excellent file recovery software package. It also supplies patches to remove copy-protection. Allows for recovery of files stored <i>on</i> a hard disk drive. (Micro Analyst Inc.)
DiskTools II™	Another desk accessory which allows you to do many Finder functions from within an application. Can also set file attributes, find files, etc. From Battery Pak DA collection. (Electronic Arts)
ResEdit™	The ultimate resource editor. Change icons, dialog boxes, menus, and, with experience, rewrite or customize software for your needs. Very useful. (Apple)

Problems

Multiple Drive Icons (5-7) Appear on the Desktop

This occurs when a SCSI device is set to SCSI ID 7, which is the same SCSI ID number as the Macintosh, thus causing a conflict. Make sure the SCSI ID number is between 0 and 6.

The Drive Performance Has Slowed Considerably

Normally, as more files are loaded on the drive, the Finder will require a little more time keeping track of everything. However, this should not significantly slow down the performance of the drive. If it really feels sluggish, try rebuilding the desktop (see Chapter 9). We suggest doing this every three or four weeks.

Occasional High-Pitched Squeal

Usually indicates that a static charge is building up. Make sure the BackPac is plugged into a grounded outlet.

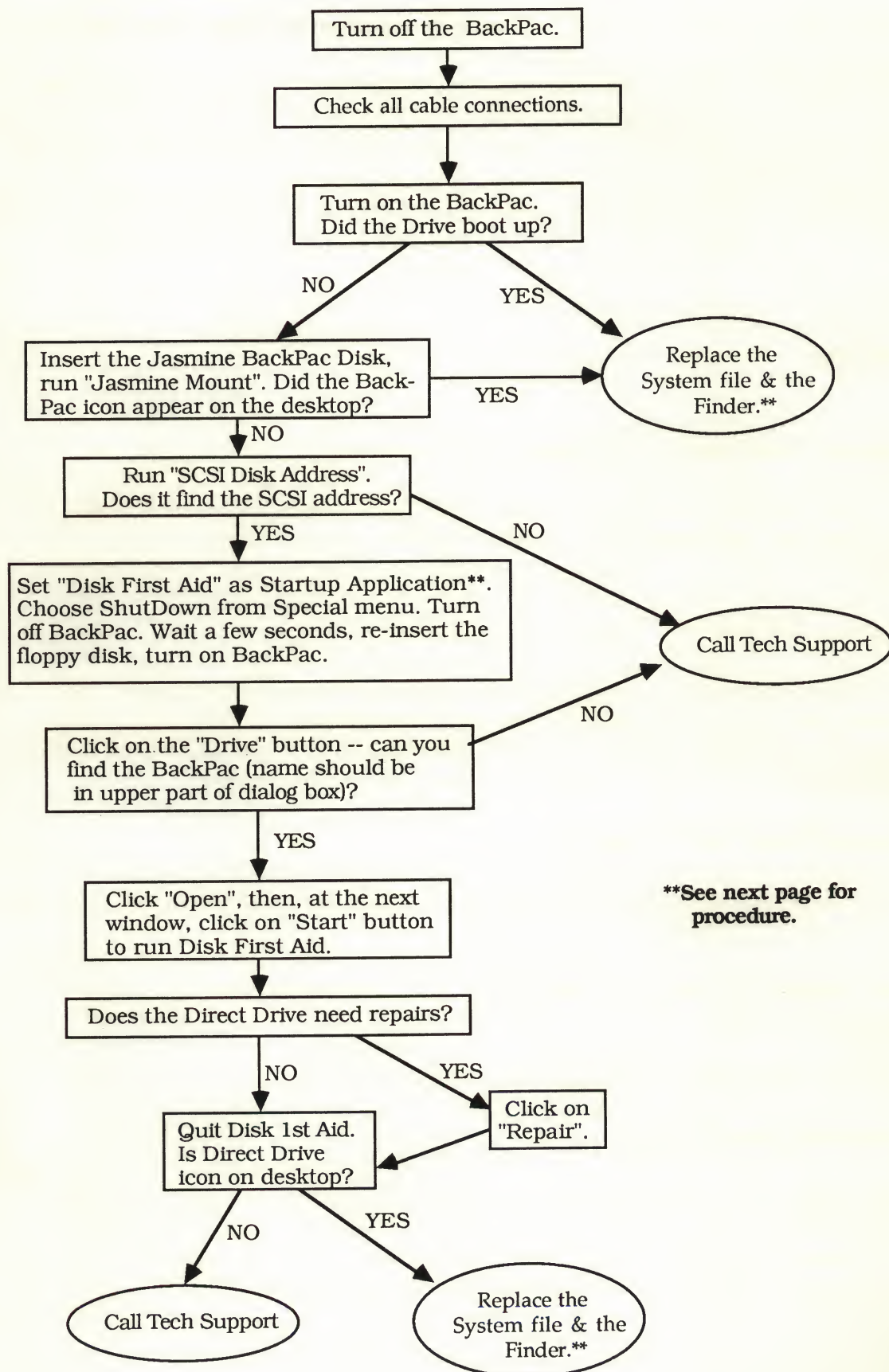
Does Not Boot Up Properly -- Alternates Between Happy Mac Icon and Blinking Question Mark Icon

Usually indicates that the System file is corrupted and needs to be replaced.

The BackPac Doesn't Boot Up

This is a common problem, as there are many different factors which may lead to this symptom. Usually the System file has been corrupted and needs to be replaced. (In technical jargon, the boot blocks need to be re-written.) On the following page you will find a flowchart to help you work through this problem.

Problem: The Hard Drive Will Not Boot Up



****See next page for procedure.**

Additional Notes

Setting an Application as the "Startup Application": From the desktop level, select the application you want to become the startup application. Then choose Set Startup from the Special Menu. On re-booting, the application will automatically run.

Replacing the System file and the Finder: You will not be able to replace the System file and the Finder if they are part of the *current* startup system. On dragging these files to the trash, the following dialog box will appear: "That item is locked or in use, and can't be removed."

When the Macintosh is switched on, it will first look for a startup disk in the internal drive, and, if one is not found, it will look to the external drive (if one is connected), then to any hard drives, and finally to the SCSI port.

Turn off your equipment. Insert the Jasmine BP Disk (or any other floppy disk containing the most recent version of the System and Finder) into the internal drive. Now switch on the BackPac.

The diskette will boot up first, *followed* by the hard drive. Now it will be possible to replace the System/Finder on the hard disk, as these files are not part of the *current* startup system.

Open the System Folder on the hard drive and drag the System file and the Finder to the trash. *Empty the trash.*

Open the System folder on the diskette and drag over its System file and Finder to the hard disk.

Choose Shut Down (Restart if using Finder 5.4 or greater) from the Special menu. The Macintosh will eject the floppy disk and the BackPac will boot up.

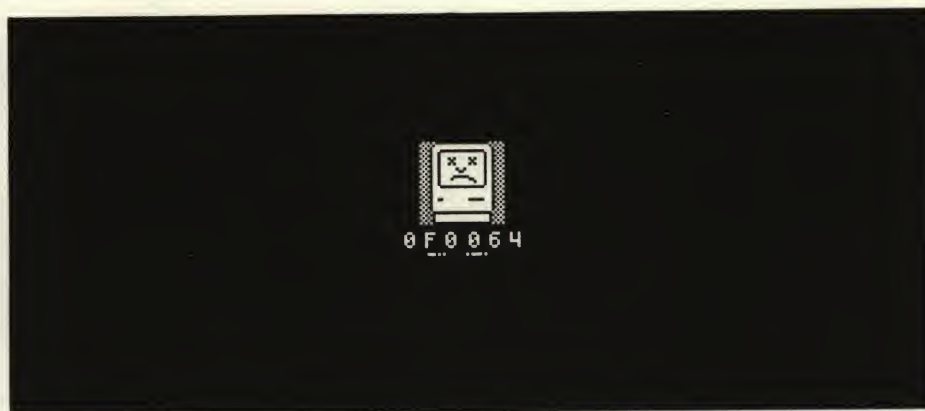
Note: If you need to replace your System/Finder on the hard disk, we recommend replacing them with the system files from the Jasmine BP Disk. However, if you have spent a great deal of time customizing your System file, that is, installing your favorite fonts and desk accessories, we suggest keeping a backup of this System file and the Finder on a floppy disk. Then, when necessary, you need only replace a corrupted System file with your customized, backup one, thus avoiding having to re-install all those DA's and fonts.

Chapter 12 - File and Disk Recovery (A Beginner's Guide)

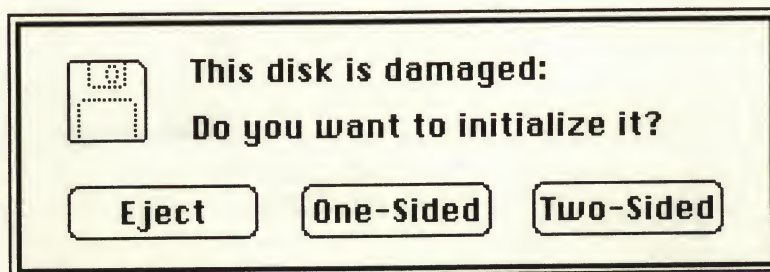
Written by Steve Costa

Reprinted from the "Late 1986" BMUG Newsletter

Well, it's late at night and you are just putting the finishing touches on your thesis, financial report, Great American Novel, etc. and a Mac owner's worst nightmare happens. The power goes out, or someone pulls your plug or lighting strikes and... when you reboot, you look at your Mac screen and see...



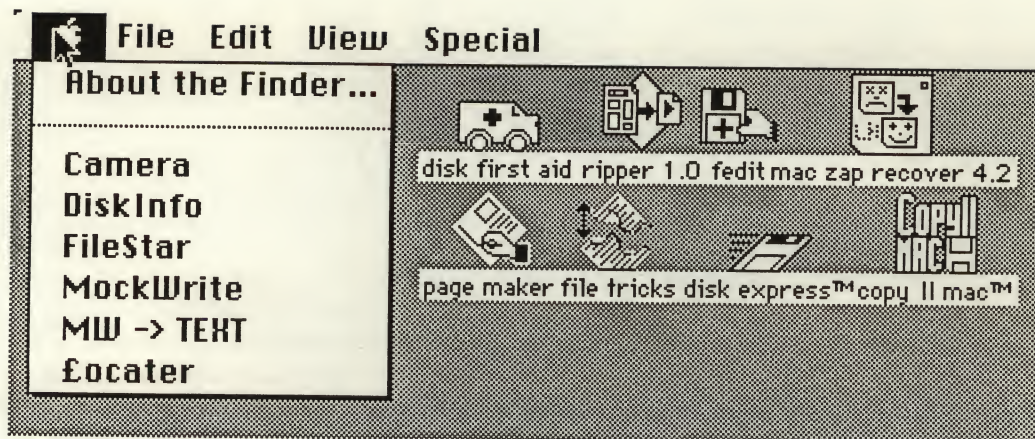
Do you panic? No, you cleverly boot up your Mac with another System and stick the offending disk in your external drive, but the gods this time weren't listening because you see in the middle of your screen one of the Macintosh's worst error messages...



Do you panic now? Nope! You're just beginning to fight!!!

Hmm, enough of this for now... How does one recover from this type of error? Here at BMUG, we receive one way or another about 5 to 10 floppies a week and a few hard disk drives that fit into this type of situation. And we are able to repair or recover about 90% of the disks and data. All it takes is the right software and a little knowhow.

First, the software that you will need: I'll explain why and how to use the following programs to help recover, hopefully, your lost files and disks.



Some of the programs are ShareWare, like *DiskInfo* and *File Star*, and others, like *Mac Zap Recover* are commercial products.

To get started, you need to make a copy of your floppy disk with *Copy II Mac* or any other sector copier. Do not just drag from the Finder. Do not make a bit copy. Bit copiers make too good a copy of your disk. A sector copier may actually fix your disk by copying new repaired sectors while a bit copy copies over the damaged sectors as they are.

Now is the time to determine whether this will be easy or time-consuming. The easy way out is by using *Disk First Aid*, a program from Apple that comes with all new Apple Hard Disk drives. *Disk First Aid* is aptly named. When it works, it makes repairs and gives you back your disk in good shape. It does have a few drawbacks as it only works with HFS volumes. So, if after running *Disk First Aid*, you get this message:

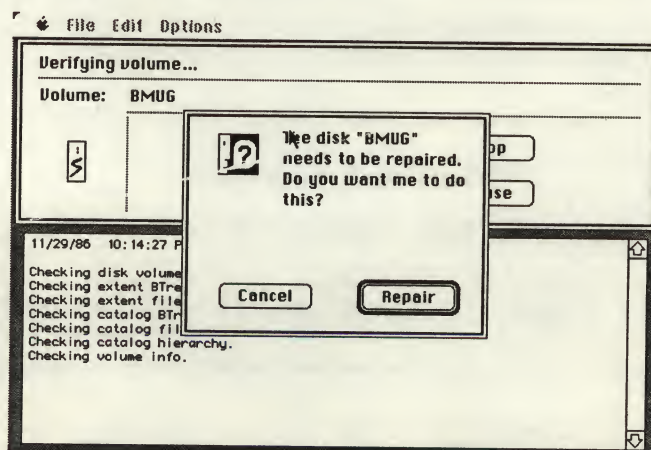


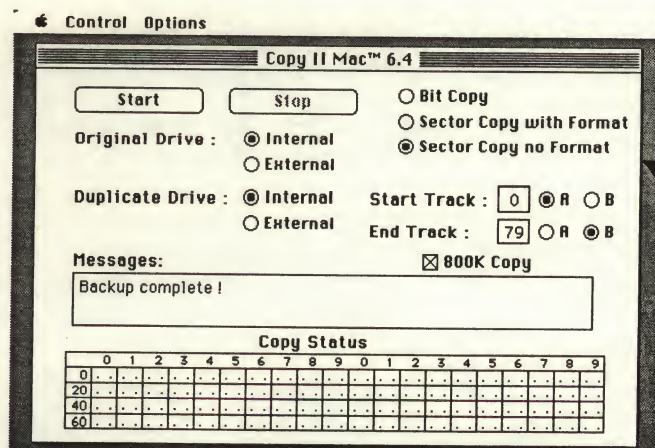
Figure 1.

You do want to click on the **Repair** button. I've never known it to make a mistake and leave a disk worse than it was before it started. If it tells you that this disk "Cannot Be Verified" it can mean any number of things, some of them worse than others. Still, *Disk First Aid* may be able to help. *Disk First Aid* can do something that no other file recovery programs do or do well. **It can mount your floppy or hard disk even if one of the various directories is corrupted**, and a

corrupted directory is the major cause of all Macintosh disk errors. The B-tree and catalog hierarchy are all part of the Macintosh directory. (You can see *Disk First Aid* checking the directory in the upper right of Figure 1.) And once you have your damaged disk or drive mounted, you can use DA's to copy your files off it with either *HFS Locator* or *FileStar*. In fact, with regard to hard disks, this is probably the only way to save your files if *Disk First Aid* wasn't able to repair it. If this fails with a floppy disk, there is still hope. Use the **Search** command of either *File Star* or *HFS Locator* and after you find the file you want, go to **Copy** and copy it to another disk. With *Disk First Aid* and assorted DA's, you can recover about 30 to 40% of bad disks and drives. This is all that can be done at first to recover and repair whole disks as opposed to files on a disk.

Now it gets harder. To go on, we need one more thing: BMUG Disk #50. BMUG Disk #50 is a special 800K MFS (Macintosh File System) disk that has allocation blocks set at 1 while a normal 800K MFS disk has them set at 4 and an HFS (Hierarchical File System) disk has them set at 8. What this means is that we can play around with a damaged 800K HFS disk and *Fedit Plus* and recover most of the files. BMUG Disk #50 has a special track 0, which is where the various directories are kept. It is a completely blank directory; it has no Desktop file or any of the other nice things which make a Mac disk a Mac disk.

After making an 800K copy of your damaged disk, set *Copy II Mac* to copy only **track 0**, and copy BMUG Disk #50's track 0 over to your copy of your damaged disk. Be sure that "**Sector Copy no format**" is selected. (Figure 2)



Be sure this is selected!

Figure 2

After copying over track 0, go into *Fedit Plus*. Your damaged disk should be mountable from *Fedit* now. Do not put your almost-fixed disk into the drive so that the Finder creates a Desktop file. If, by chance you did, this is what you'd find:



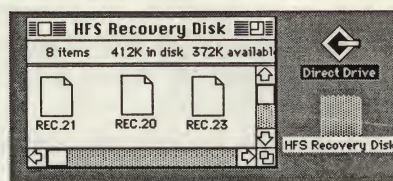
As you can see, it's completely blank, and an MFS 800K disk besides. These days it's still easier to recover MFS disks than HFS disks. Now you need to go into *Fedit Plus*. Generally, you get a slightly better percentage of recovered files if you don't allow the Finder to see your disk before you start into *Fedit*.



fedit

Special	
Next Display Buffer	⌘+
Previous Display Buffer	⌘-
Specify Display Buffer...	⌘B
Multiple Sector Read...	
Multiple Sector Write...	
Write Sectors to File...	
Link to Data Fork	
Link to Resource Fork	
Create File...	
Select Output File...	
Validate Tags	
Recreate Volume Map	
Recover Deleted Files	

Once in Fedit, go to the File menu and select Volume to open your damaged disk. Now off to the Special menu and down to "Recover Deleted Files". Because we replaced the damaged directory on track 0 with a blank track 0 from BMUG disk #50, we can recover files on the disk as if they had been thrown away.



While Fedit can recover these files you still can't open them yet. As you can see, all you get are files with the icon that the Mac gives files that it doesn't know what to do with. But we can change that by setting the Type and Creator. To set the Type and Creator you need to go to the Display menu and select "Finder Attributes". the box that pops up will have 2 small buttons to fill. Put whatever the correct Type and Creator are.

Type	WORD	Creator	MACA
<input type="checkbox"/> Locked	<input type="checkbox"/> Changed	<input type="checkbox"/> File Protect	
<input type="checkbox"/> Invisible	<input checked="" type="checkbox"/> Init'd	<input type="checkbox"/> File Lock	
<input type="checkbox"/> Bundle	<input type="checkbox"/> Shared	<input type="checkbox"/> File Busy	
<input type="checkbox"/> System	<input type="checkbox"/> Cached		
<input type="checkbox"/> Bozo	<input type="checkbox"/> On Desk		
<input type="checkbox"/> Busy			
<input type="checkbox"/> Always Switch Launch			
		Change	
		Cancel	

In MacWrite's case the correct Type is WORD and the Creator is MACA. As you can see, it works.



Now we are through with the easy part. If none of things that I've just gone over have worked we will need to go to a few of the other programs on my Disk Fixer disk.

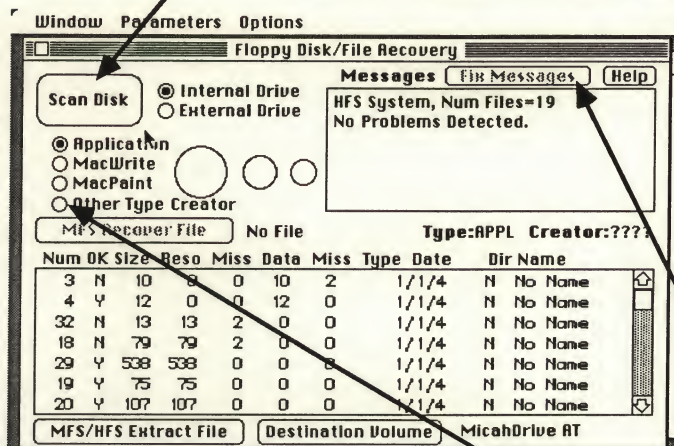
Next we need to take a look at the *Mac Zap Recovery* programs. There are two of them. The first is *MacZap*. The second is *MacZap HFS*. Both *Mac Zaps* can do a few things that *Fedit* can't do such as recover files that are damaged in some way, or recover files from a SCSI disk. Each will do its best to recover most of a file if it can't recover all of the file due to some data that has been damaged. *MacZap HFS* can do much more, such as completely recover an 800K HFS disk or mount a corrupted SCSI drive and extract the files from it. I'll go over *Mac Zap MFS* and then go over *MacZap HFS*

First, launch *MacZap*.

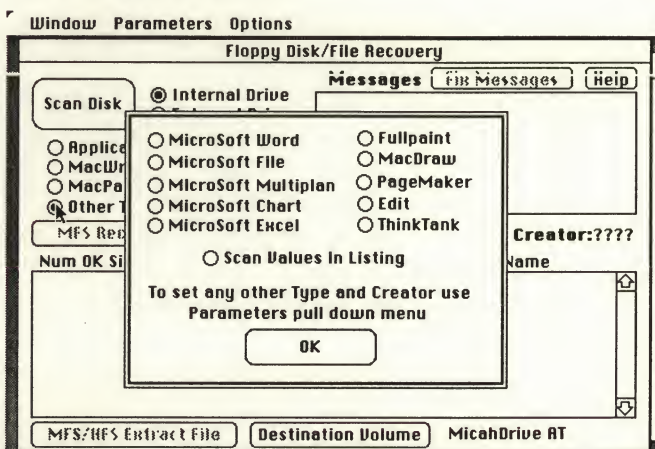


Now go to Scan Disk. Mac Zap will scan the disk and tell you what files it thinks it can recover. Mac ZapMFS is still not completely HFS compatible as it cannot tell you what the names are of any files on an HFS disk. So it can take some detective work

to recover the file that you want. You can compare the size or what kind of File it is. To extract the file go to "MFS Recover File" if it is a 400K, and "MFS/HFS" Extract File" if is an 800K disk. If Mac Zap thinks it can repair your disk, the Fix Messages button will be highlighted.



It sometimes works but only do it after it extracts all the files it can. Mac Zap can automatically set the Type and Creator by setting the defaults in the Parameter menu.

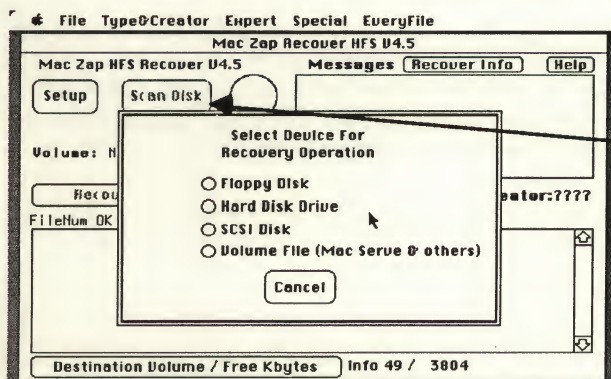


Or you can set them from "Other Type Creator". Every file that you extrac will have the Type and Creator that you've set.

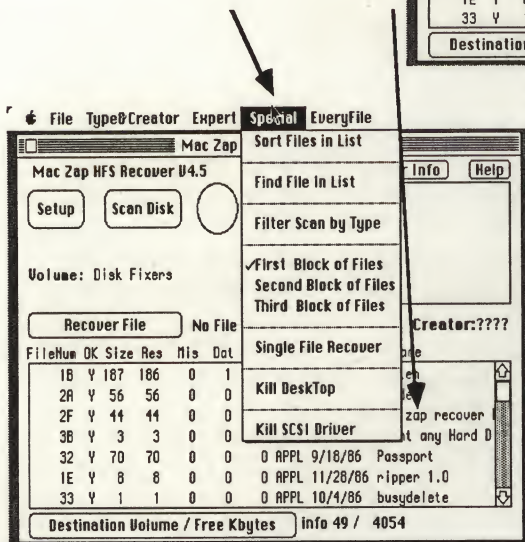
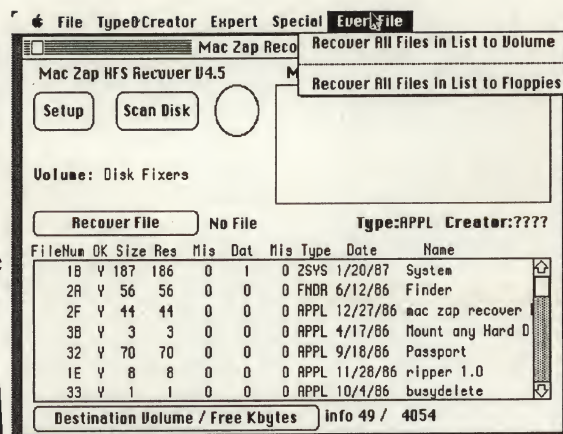


Mac Zap Recover HFS is somewhat easier to use than earlier versions of MacZap. To get

started click on Setup after launching MacZap Recover HFS. It will allow you to select a floppy or a hard disk or even a Mac Serve volume to recover. After selecting one, the next step is to Scan Disk. Scan Disk will read the whole disk and make a attempt to scan the disk. and read the files on it. With a 50 meg drive this can take several minutes. It will show all the programs that it thinks it can recover. That can mean 10 to 20 files or for large drives , in the thousands. In cases where there are thousands, you can select the files that you want to recover.



Now you can extract files that you want by going to EveryFile which, as the name implies, will recover every file it can. To recover single files, go to the Special menu. This menu has a number of commands in common with MacZap MFS that can help a great deal in file recovery. Kill DeskTop can at times fix some of the more mysterious disk crashes.



There are numerous other very powerful commands that can help in file recovery, but for the most part, one needs to be an expert to use them.

Fortunately, one doesn't always need such power programs as MacZap to recover files like MacWrite documents. You can use other programs that you may have to open or repair damaged files. I'll give an example with MacWrite.

Applications like *MacWrite* or *PageMaker* are mostly resources and most data files are mostly data with a resource or two. *PageMaker* and *Helix* files are the exception. They are almost completely resources. There still are a few ways to recover files from *MacWrite* which I'll go over.

There are two ways that you can go, depending on what kind of file you have to recover. In our disk of tricks there are a few programs, such as *PageMaker* and *Ripper*, that are good for only one thing. *Page Maker* is here because it can open up many corrupted *MacWrite* files. The most common cause for a *MacWrite* file is a corrupted "end of file" segment. *MacWrite* and *Word* need to know how long a file is before they can open it. *PageMaker* is one of the few programs that doesn't need to know this information to open a *MacWrite* file.

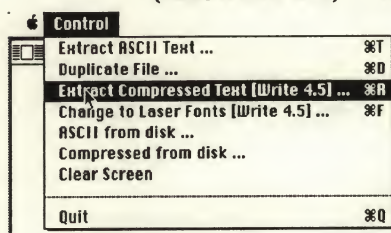
1. To start, you need to load *Page Maker* and *MacWrite* into *Switcher 5.01* (or greater). Then use the **Place** command in *PageMaker* to load the *MacWrite* file, which should slide right in with all the correct formatting. One page at a time, **Copy** the *MacWrite* file into the clipboard, switch to *MacWrite*, and **Paste**. (Be sure and select **Always Convert Clipboard** in *Switcher* options.)

2. *HabaWord* is another program that doesn't need to know where a *MacWrite* file ends. Use the **Paste Document** in *HabaWord*. Try *Word* as well. If the *MacWrite* file is too corrupted, none of these tricks will work. Then you have to use another program called *File Trickss*, a very handy program.

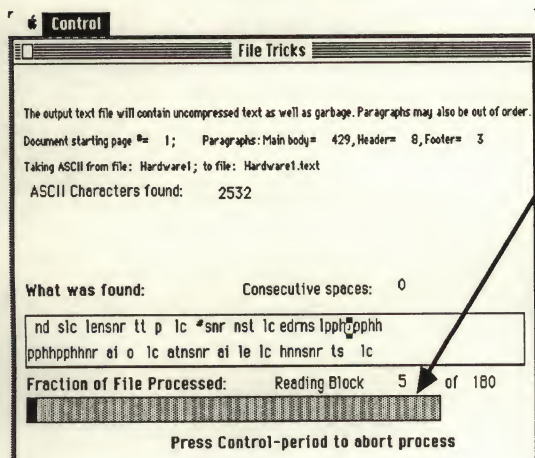


file tricks

To use File Tricks to recover MacWrite file, or even a few other things, go to the Control menu and select "Extract Compressed File (MacWrite 4.5)". What that will give you is a



text file. You will lose all your formatting but you will have something to work with. The other selections like "ASCII from Disk" and "Compress from Disk" are to used in order of desperation.



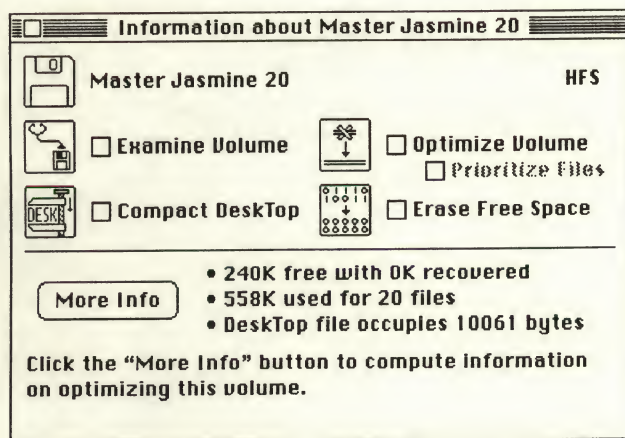
File Tricks will uncompress your MacWrite file and save it as text file and show you what it is saving and show you how far along it is.



ripper 1.0

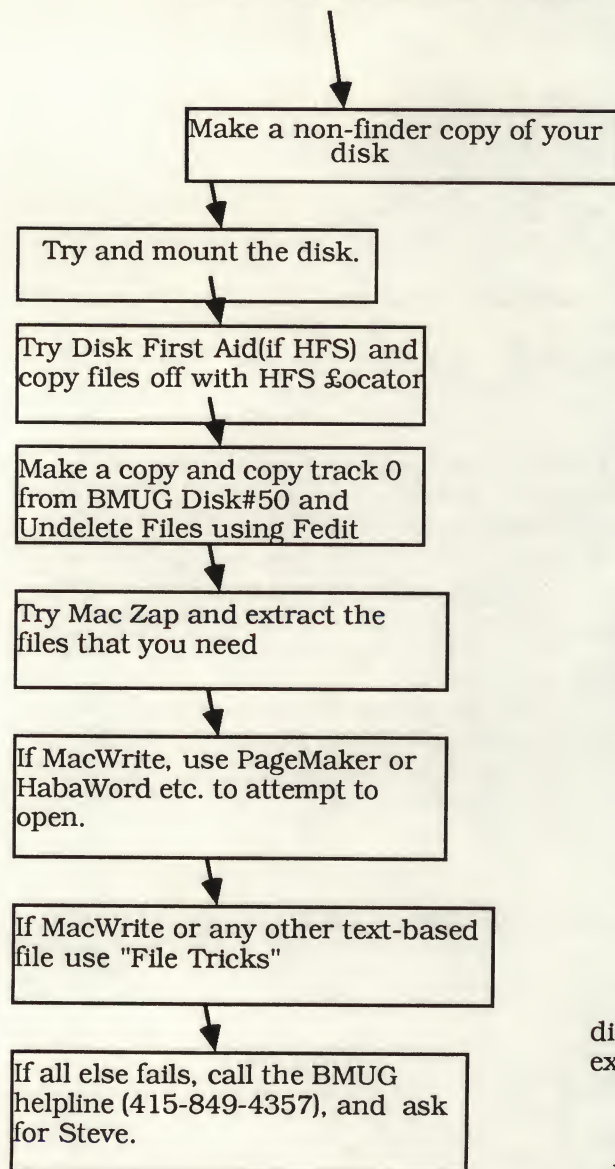
Ripper is a great program for recovering PageMaker files. It will take a PageMaker file and save it as an Acta file with the graphics and text separate. A PageMaker file is almost all resources. If one of its many resources is corrupted PageMaker will not open it up. Ripper will though! But if the resource map is corrupted Ripper will not be able to help.

Last but not least is *Disk Express* which sometimes will repair minor directory problems, though that isn't what it's normally used for.



Disk Express, by resetting your allocation blocks to what they should be, can solve a few of a damaged disk's problems. And it's a good utility for speeding up a drive that has been used for a long time without being reformatted.

What to do if you have a bad disk:



copy II
mac™



mac zap recover



Fedit
Plus



ripper



file
tricks



disk first
aid



disk
express™ 1.1

HFS Locator

FileStar

Copy II Mac is a product
of Central Point Software
9700 SW Capitol Hwy.
Suite 100
Portland, OR 97210 \$29

Mac Zap \$59
Micro Analyst, Inc
PO Box 15003
Austin, TX 78761

MacMasters \$40
108 E.Fremont Ave.
Sunnyvale, CA 94087

James E. Hopper \$10
ShareWare
7135 Springboro Pike
Dayton, OH 45449

Joseph F. Buchanan
University Of Utah

Apple Dealers Free
Bill Bruffy
Karl B. Young

Al Whipple \$29
Larry Davis
ALSOFT
PO Box 927
Spring, TX 77383

PBI Software \$29
Marsh Gosnell

ShareWare \$15
Searle Software International
Mukilteo, WA 98275

BMUG Disk #50 is available for \$4 from BMUG, 1442A Walnut #62, Berkeley, CA, 94709. This article, which originally appeared in the "Late 1986 BMUG Newsletter" is Copyright © 1987, BMUG, Inc. Not-for-profit user groups may reprint it so long as they leave in this notice, and send a copy of their newsletter to BMUG at the above address.

This article is just a primer for beginners in file recovery. BMUG Disk #50 will consist of this article plus additions as time goes by. It will be a two-disk set with the various PD (public domain) and ShareWare file recovery tools. If people have any questions please write or call and I'll do my best to help.

Steve Costa is the Software Librarian for BMUG (Berkeley Macintosh Users Group). If you are interested in joining BMUG or acquiring any of their software disks (\$3.00 each!), call (415) 849-9114 or write to BMUG, Inc., 1442A Walnut St. #62, Berkeley, CA. 94709.

Appendixes

Appendix A - Specifications (Minimum)

The BackPac has been assembled using the best components available. Listed below are the specifications and technical product descriptions for the BackPac 40.
(8/1/87)

Controller Operations

Supports Disconnected Operations and Linked Commands
Selectable SCSI Bus Address
1 Kilobyte FIFO Buffer (First In First Out)
Extensive Diagnostics and Fault Detection Provided
Reports Error and Usage Information
Maximum Data Transfer Rate: 1.00 Mbytes/sec.
Average Data Transfer Rate: 625 Kbytes/sec.
Maximum Cable Length 19.7 ft. (6 meters)
Provides Support for Arbitrating and Nonarbitrating Host Systems

Drive Parameters

Formatted Macintosh Capacity (fixed):	40 Mbytes
Bytes per Cylinder:	36,104 bytes
Bytes per Tracks:	13,312 bytes
Bytes per Sector:	512 bytes

Performance Specifications

Seek Time	
Track to Track:	10 msec.
Average:	29 msec.
Maximum:	50 msec.
Average Latency:	8/33 msec.
Actuator:	Rotary Voice-Coil Motor

Functional Specifications

Tracks:	3,008
Read/Write Heads:	4
Disks:	2
Rotational Speed:	3,600 RPM

Reliability Specifications

Mean Time Between Failure:	20,000 Power-on Hours
Component Design Life:	5 years

Ambient Specifications

Operating:	5 to 55 C (50 to 130 F)
Nonoperating:	-40 to 60 C (-40 to 140 F)
Relative Humidity	
Operating:	8 to 80% Noncondensing
Nonoperating:	8 to 80% Noncondensing
Altitude	
Operating:	-200 ft. to 10,000 ft.
Nonoperating (max):	40,000 ft.

Shock Rating

Operating Shock: Maximum shock permitted -- 5 G's without physical damage or degradation in performance.

Nonoperating: Maximum shock permitted -- 75 G's without physical damage or degradation in performance.

Power Supply / Line Requirements

Jasmine uses different manufacturers for power supplies.

The Jasmine BackPac has the ability to be adapted to any of the following line voltages: 110/120/230/240 volts.

Switchable only by qualified service technicians.

Line Frequency

50/60 Hertz capability

Any frequency from 47 Hz. to well above 150 Hz. can be used. Any frequency commonly found in standard wiring around the world can be used. Consult Jasmine for non-standard wiring or consult your electrician.

Power consumption:	20 watts (minimum capability)
Typical configuration:	30/40 watts
Mean Time Between Failure:	40,000 Power-on Hours
Component Design Life:	10 years

Appendix B - Jasmine Software Update Policy

Jasmine Update Policy

Jasmine Technologies, Inc. offers lifetime system software upgrades to the original purchaser of any BackPac. This upgrade policy is for upgrades that are due to software improvements in the BackPac and are not of a major design change or application change. Jasmine reserves the right to charge reasonable fees to distribute the software and cover costs involved in notifying our customers. Jasmine will notify customers through mailings, during technical support calls, and on BBSs. Customers that receive updates through telecommunications, including bulletin boards, etc., are requested to send the appropriate amount due to Jasmine Technologies, Inc. to help defray costs and encourage Jasmine to provide further updates.

Updates do not include new product offerings and applications that are related to the BackPac but sold separately. Jasmine considers an upgrade to be that which allows the user to improve the BackPac software to current standards of performance. Jasmine does not consider future products that are sold separately as individual products to be included as upgrades.

Appendix C - 30 Day Money Back Guarantee

Jasmine Technologies, Inc. offers a 30 day money back policy. To obtain a full refund of your purchase price, you must observe the following guidelines:

1. Contact Jasmine Technical Support (415-621-1680) within thirty (30) days from the shipping date.
2. Obtain an RMA number (Return Merchandise Authorization) which must be written clearly next to the mailing label on top of the shipping box for identification when received. **Unauthorized and/or unidentified shipments will be refused.**
3. The BackPac and *all related materials* must be returned **in their original condition**. This includes any cables, diskettes, documentation, etc.
4. Shipping charges to Jasmine are your responsibility. **COD's will not be accepted.**
5. Shipping Method -- Jasmine advises that you ship via air freight or a good, reliable surface carrier who handles *sensitive* freight. Do not ship UPS, Parcel Post, Express Mail, etc., as these types of carriers have been found to mishandle sensitive freight. If you are uncertain about whether your intended return shipping method is approved, please *ask at the time you call for return authorization*. If an unauthorized shipping method is used, you may jeopardize your ability to obtain a full refund. The BackPac should be sent insured so as to protect your liability in case of damage from the carrier.
6. Upon receipt, Jasmine will inspect the Drive and container for damage. If any damage is found, you will be notified and an appropriate fee will be charged to restore the items in question to their original condition. **Jasmine Technologies, Inc. is not liable for damages caused by damage, improper shipping, or other defects incurred outside of our facility.**

Upon acceptance of your BackPac, Jasmine will issue the appropriate refund, usually within three to five business days.

Appendix D - Returning Drive for Service

If your drive ever needs to be returned for service, you must follow these steps:

1. Contact Jasmine Technical Support (415-621-1680). If it is determined that the drive must be returned, you will be issued an RMA number (Return Merchandise Authorization).
2. Write your name and the RMA number on a small strip of paper and tape it to the drive.
3. The RMA number must also be written clearly next to the mailing label on top of the original shipping container for identification when received. **Unauthorized and/or unidentified shipments will be refused.**
4. Include a short note describing the problem. The RMA number should also be written on this note.
5. Unless otherwise instructed, **only return the BackPac** (in the original shipping container).
6. Shipping charges to Jasmine are your responsibility. **COD's will not be accepted.**
7. Shipping Method -- Jasmine advises that you ship via air freight or a good, reliable surface carrier who handles *sensitive* freight. Do not ship UPS, Parcel Post, Express Mail, etc., as these types of carriers have been found to mishandle sensitive freight. If you are uncertain about whether your intended return shipping method is approved, please *ask at the time you call for return authorization*. The BackPac should be sent insured so as to protect your liability in case of damage from the carrier.
8. If the above-mentioned steps are followed, Jasmine promises a maximum 48 hour turnaround on any drive that needs repairs.

Note: Please remember your RMA number, as the technical staff will need this reference number to answer any inquiries concerning your equipment.

